THE IRON TRADE REVIEW

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Leading Mills Refuse to Book New Tonnages

On Account of Large Volume of Orders Unfilled—Tremendous Movement of Ore — Independents Made Good Showing

Important producers of plates, shapes and bars and some other materials are fighting off business. Order books of these makers, especially in the Pittsburgh and Chicago districts, are so filled that sales managers are refusing to yield to the importunities of buyers who wish to make contracts for deliveries into the third and fourth quarters of this year, and in some cases, the first half of next year. While the tonnage of wire and some other lighter products has declined slightly, the demand for bars and heavier materials has more than made up the loss in the lighter products. Eastern ship builders are so busy that it is doubtful whether they will be able to take contracts for any of the ten large ore boats for which the Bethlehem Steel Co. is asking tenders. These vessels are to be used in transporting ore from the Chilean mines recently acquired by the Bethlehem company to eastern ports through the Panama canal.

Pig Iron

The activity of cast iron pipe makers has brought new life to the eastern pig iron market. A Lynchburg pipe foundry closed for about 7,500 tons of No. 3 and forge pig iron for second quarter, another company bought 2,000 tons in addition to recent purchases, and nearly every cast iron pipe maker in the Delaware river district is figuring on buying pig iron. A Harrisburg company has purchased 3,000 tons of basic for third quarter delivery at about $17.75, delivered. The Lackawanna Steel Co. has taken 5,000 tons additional of hot metal from the Susquehanna furnaces. In the sale of 3,000 tons of basic to a Cumberland steel maker at about $17.75, delivered, Cleveland and Steubenville makers competed very keenly. In the south, the market continues weak, and the tonnage of iron for sale by furnaces on the basis of $13 for No. 2, Birmingham, is larger.

Structural Material

Many projects for new buildings are being developed throughout the country. The most important of these is the new tri-borough rapid transit system, New York, the plans for which have just been approved by the public service commission. It is expected that bids will be asked in a few days for construction work and that the ultimate requirements will be 350,000 to 400,000 tons of steel. Much construction work is being delayed on account of slow delivery of materials, or is being completed at heavily increased costs. For the construction of an open-hearth furnace in Cleveland, a large part of the material has been taken from jobbers' stocks in Chicago. Eastern Pennsylvania mills are still able to ship into central western territory at premium prices, the usual quotation for such shipment being 1.65c, mill. For eastern delivery, the eastern Pennsylvania mills continue to quote shapes at from 1.50c to 1.60c, Pittsburgh. Lettings of the week were light.

Iron Ore

The strength of the independent ore mining companies is shown in a very impressive manner by the statistics of shipments of ore from the Lake Superior ranges, whose compilation for 1912 has just been completed. The entire movement by rail and lake was 48,211,778 tons, compared with 32,793,130 tons in 1911, a gain of 15,418,648 tons. Of this great total, the independents last year shipped 50.54 per cent, although in 1911 they shipped only 47.3 per cent. The statistics reveal the great activity of the Steel Corporation in shipping from the properties covered by what is popularly known as the Hill ore lease, which expires Jan. 1, 1915. Shipments from the Hill ore lands last year were nearly 7,000,000 tons, and the total which must be shipped before the expiration of the lease is 12,150,000 tons. This can easily be done. The great Mesabi range last year shipped 32,047,409 tons, but its share of the total shipment was about 1 per cent less than in 1911. This shows that the old ranges of Michigan and Wisconsin are by no means in a state of decadence.

Pig Iron Production

The blast furnaces of the country continue to make a wonderful record. As February had only 28 days, its total was 207,341 tons less than that of January, when 2,787,800 tons were made. But the daily average production for February was 92,159 tons, compared with 89,929 tons for the preceding month. The merchant furnaces made a better record than those of the steel plants. There were 306 furnaces in blast on the last day of February, a gain of nine, compared with the last day of January, and it will not be at all surprising if March makes a new record.

Average Daily Pig Iron Output Shows Gain

Rate in February Was 92,159 Tons Compared With 89,929 Tons in January--Total Production Was 2,580,459 Tons

The production of coke and anthracite pig iron in the country in February was at the rate of 92,159 tons a day, easily the highest daily average ever maintained for any one month. The increasing number of stacks being put in blast is responsible for the advancing rate of production.

The total output is February of coke and anthracite pig iron was 2,580,459 tons, compared with 2,787,800 tons in January. The loss of 207,341 tons is due to the fact that January had three more days. Production last month was the highest of any February in American iron history.

In daily average production, February made a large gain. The daily rate maintained during last month was 92,159 tons, compared with 89,929 tons for the preceding month, a gain for February of 2,230 tons. Production last month was at the rate of 33,638,035 tons annually.

AVERAGE DAILY PRODUCTION.

	1913.	1912.	1911.
January	89,929	66,220	56,989
February	92,159	72,372	63,617
March	.....	77,791	69,863
April	.....	79,254	68,163
May	.....	80,753	60,367
June	.....	81,125	59,109
July	.....	77,502	57,294
August	.....	80,650	61,995
September	.....	81,482	65,797
October	.....	86,569	67,486
November	.....	87,985	66,637
December	.....	89,590	65,558

The merchant furnaces showed a larger percentage of gain than the steel works or non-merchant furnaces. The production of merchant iron in February was 750,002 tons, against 774,208 tons in January, a loss of 24,206 tons. Steel works furnaces produced 1,808,713 tons in February compared with 1,994,363 tons in January, a loss of 185,650 tons.

MONTHLY PRODUCTION.

	1913.	1912.	1911.
January	2,787,800	2,052,806	1,766,658
February	2,580,459	2,098,796	1,781,285
March	.....	2,411,529	2,165,764
April	.....	2,377,621	2,044,904
May	.....	2,503,341	1,871,388
June	.....	2,433,737	1,773,282
July	.....	2,402,567	1,776,108
August	.....	2,500,163	1,921,832
September	.....	2,444,454	1,973,918
October	.....	2,683,645	2,092,061
November	.....	2,639,562	1,999,100
December	.....	2,777,292	2,032,301
Totals	5,368,259	29,325,513	23,198,601

The daily average production in February of the merchant furnaces showed a gain of 1,812 tons over January's rate, while the non-merchant furnaces made a gain in average daily production of only 263 tons. The daily average production of the merchant furnaces in February was 26,786 tons, compared with 24,974 tons in the preceding month. The steel works maintained a daily rate of 64,597 tons against 64,334 tons in January.

There were 306 stacks in blast on the last day of February compared with 297 on Jan. 31, a net gain of nine. Of the merchant furnaces, seven were relighted and one blown out, a net gain of six. Four non-merchant stacks were put in blast and one blown out, a net gain of three. In all, 11 furnaces were relighted and two blown out. More than 300 stacks have not been in blast since March, 1910.

The output of spiegel in February was 11,907 tons, against 12,104 tons in January, a loss of 197 tons. The production of ferro was 9,837 tons, compared with 7,125 tons in January, a gain of 2,712 tons.

The merchant furnaces relighted last month were: Musconetcong, of the Musconetcong Iron Works, on Feb. 27; Niagara A, of the Tonawanda Iron & Steel Co.; Jisco, of the Jackson Iron & Steel Co.; Delaware River, of the Delaware River Steel Co., on Feb. 24; one Saxton, of Joseph E. Thropp, on Feb. 26; one Allens Creek, of the Bon Air Coal & Iron Co., and Dora, of the Virginia Iron, Coal & Coke Co. Marshall of the Juniata Furnace & Foundry Co. was blown out Feb. 10.

The non-merchant furnaces relighted were: South Works No. 8, of the Illinois Steel Co., on Feb. 3; "B," of the Bethlehem Steel Co., on Feb. 7; one Newcastle, of the Carnegie Steel Co., and Lochiel, of the Pennsylvania Steel Co. Gary No. 7, of the Illinois Steel Co., was blown out Feb. 10.

FEBRUARY PIG IRON.

States.	No. of stacks.	No. in blast last day of month. Feb.	Jan.	Total tonnage made. Merchant.	Non-Merchant.	Totals— Feb.	Jan.
Pennsylvania	159	128	124	205,768	854,388	1,060,156	1,162,044
Ohio	72	60	59	173,087	416,969	590,056	625,173
Alabama	45	24	24	107,480	57,308	164,788	180,817
Virginia	21	9	8	32,151	.....	32,151	26,616
New York	27	21	20	90,314	92,259	182,573	193,728
New Jersey	7	2	1	5,644	.....	5,644	5,833
Illinois	26	23	22	46,149	207,287	253,436	280,968
Colorado	6	3	3				
Indiana	10	9	10				
Maryland	4	3	3				
Wisconsin	6	5	5	25,957	158,538	184,495	203,806
Kentucky	7	2	2				
West Virginia	4	3	3				
Tennessee	18	10	9				
Washington	1	.	.	39,148	21,964	61,112	62,572
Georgia	2	.	.				
Texas	3	.	.				
Minnesota	1	1	1				
Michigan	3	3	3				
Missouri	1	.	.	24,304	.....	24,304	27,014
Spiegel—All states...						11,907	12,104
Ferro—All states....						9,837	7,125
Totals	423	306	297	750,002	1,808,713	2,580,459	2,787,800

Talk of Steel Plant Resumed

Detroit, March 4.—Detroit manufacturers are again talking of a big steel plant in Detroit to supply them with the finished product and declare that it is bound to come eventually. It is estimated by one well informed steel man that Detroit uses approximately 400,000 tons a year, and that a plant of 100,000 tons capacity, producing exclusively for the Detroit market, would earn $1,000,000 each year. One Detroit automobile company used 90,000 tons of steel last year and will use 160,000 tons this year.

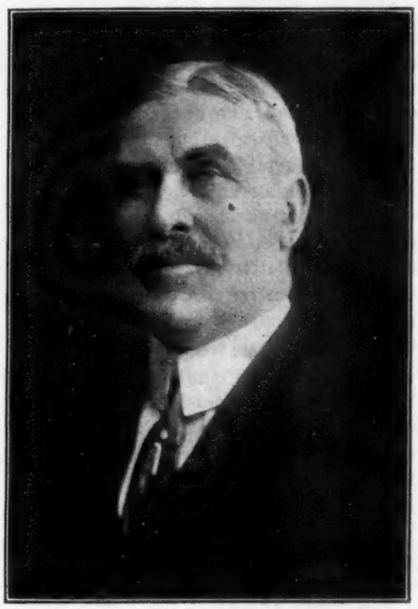
Buys More Steel

Buffalo, March 5. (By wire.)--The Lackawanna Steel Co. has bought 5,000 tons additional of hot metal from the Susquehanna furnaces. The purchase three weeks ago was 40,000 tons.

LARGE PLANT

Will be Built by National Cash Register Co. at Toronto.

The National Cash Register Co., Dayton, O., will build a large plant at Toronto, Can., on a site of eight acres, which will be served by the Canadian Pacific and Canadian Northern railways. The plant will consist of three buildings, including a foundry, 60 x 120 feet; machine shop, 300 x 60 feet, two stories high, and the main building, 310 x 60 feet, three stories high. The latter structure will contain the offices, assembling and stock departments, etc. Eventually a wood-working plant is to be erected. All of the buildings will be of uniform construction. The frame work will be of steel, the foundations con-



COL. THOMAS COSGROVE

crete and laminated wood floors will be laid.

The foundry will be equipped with two batteries of coke furnaces, 10 furnaces to a battery, and to recover the metal from skimmings, foundry ashes, etc., a washer will be installed. A large number of molding machines also will be purchased. The building will be divided into spans of 25 feet, 10 feet and 25 feet, the 10-foot span serving as an aisle, providing a working area 25 feet wide on either side. The buildings are arranged so that the stock can be routed in a direct line to the point of outlet. The large window area of these buildings will be a noteworthy feature, as the walls will contain approximately 85 per cent of window space. All of the structures will be so built that they can be added to without inconvenience and partitions will be portable and will be built of steel and glass. The basement of the main building will contain wash rooms, lockers, showers, lunch and recreation rooms and the officers' club. The services of a landscape gardener will be employed to lay out the grounds, which will include an athletic field for the company's employes. H. Daly is superintendent of the Canadian factory.

OLDEST EMPLOYE

At Edgar Thomson Plant Passes Away.

Col. Thomas Cosgrove, for the last 40 years superintendent of labor and transportation at the Edgar Thomson plant of the Carnegie Steel Co., at Braddock, Pa., and the oldest employe in point of service at that mill, died Sunday, March 2, at the Mercy hospital, Pittsburgh, following an operation performed last week.

When Andrew Carnegie and his associates bought the site for the erection of the Edgar Thomson plant, Col. Cosgrove was appointed superintendent of labor, which position he had since held. Later, when Mr. Carnegie took in the junior partners, Mr. Cosgrove was given a large block of stock in the company.

He was born in Dunbar, Scotland, Nov. 27, 1845, and accompanied his parents to Connecticut a half century ago, removing to the Pittsburgh district in 1865. He was one of the contractors who built the Pittsburgh, Virginia & Charleston railroad, now the Monongahela division of the Pennsylvania system.

Will Build Bar Mill

The Wisconsin Steel Co., subsidiary of the International Harvester Co., has let a contract to the United Engineering & Foundry Co., Pittsburgh, for a bar mill to be installed at its Chicago plant. The new mill will be used on jobbing work and will be intended particularly for handling agricultural shapes of special section, which are not required in sufficient quantity to justify their being rolled on a continuous mill. The mill will have a capacity of about 3,000 tons monthly. It is being built to a special design furnished by the Wisconsin Steel Co. and will be direct driven by a steam engine. The contract for the steel work in the building, 542 tons, has been let to the McClintic-Marshall Construction Co., and it is expected the plant will be in operation about Sept. 1.

PIG IRON DROPS

On the Pacific Coast Owing to Lower Prices on Foreign Grades.

Tacoma, March 1.—Pig iron has dropped $3.50 a ton in the last two weeks, due to the over-supply and the slow demand from local foundries. Glengarnock iron, imported by the Balfour-Guthrie Co., which two weeks ago was being sold for $27.50 and $28 a ton, has been sold in the past few days as low as $24 a ton. The Atlas Foundry & Machine Co. bought 100 tons at this price and is holding up further orders in anticipation of another drop in the market.

Birmingham iron dealers had not met the drop of the imported metal at the latest report. They were still selling at $26 and one local jobber

JOSEPH A. STONE

said they would maintain that price for the time being. If a further decline comes in the foreign iron, the domestic will have to be reduced, foundrymen predict, as they claim the quality of the two metals is practically the same.

Death of Joseph A. Stone

Joseph A. Stone, until recent years president of the Riverside Iron Foundry Co., Cleveland, and a member for many years of the administrative council of the National Founders' Association, died recently at his home in Cleveland, aged 71. Mr. Stone was well and favorably known throughout the country, especially among members of the National Founders' Association.

PITTSBURGH

Heavy Specifying of Plates and Shapes

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg., March 4.

Specifications against contracts in February for steel bars, plates and shapes were heavier than those of the preceding month, and no appreciable decrease was noted in specifications for sheets and tin plate; the average daily specifications for rails were slightly heavier than those of January. The almost phenomenal demand for material strongly indicates that the market for finished iron and steel products continues strong, and officials of leading companies do not believe that today's changes in the national administration will affect the market; at least not until its policies are more fully developed..

Pig iron, coke and scrap continue dull, although scrap reflects some strength, and there appears to be more indication of a pig iron buying movement. Continued pressure from jobbers has made it necessary for some sheet manufacturers to open books for third quarter delivery; makers have been selling to manufacturers for that delivery for some time.

Announcement that the Cambria Steel Co. expects to continue along its present line of extension is of much interest in this district. Officials state that it will require $5,000,000 to carry out the proposed plans of increasing capacity.

Pig Iron.—The pig iron market continues quiet, although better inquiry is reported for Bessemer and foundry, and fairly heavy tonnages of basic pig iron are involved in tentative inquiries that came out a week or ten days ago. Small lots of foundry iron continue to bring $17.50, valley. There seems to be a more general feeling that basic pig iron can be obtained at $16.25.

The W. P. Snyder & Co.'s average price of Bessemer and basic pig iron in February, based on sales of 1,000 tons or more, was $17.25 and $16.317, respectively, at valley furnaces. The Bessemer average corresponds identically with that of January; the basic February average is $0.133 less than the January average, $16.45, valley. About 12,000 tons of Bessemer and 4,500 tons of basic were sold last month. Compared with averages for February, 1912, last month's Bessemer and basic figures show an increase of $3.172 and $3.945, respectively. The comparatively low basic figure last month was the result of the Colonial Steel Co.'s purchase of 1,500 tons at what is said to be $16.25, valley. The following prices prevail:

(First Half.)

Bessemer, valley	$17.25 to 17.50
Bessemer, Pittsburgh	18.15 to 18.40
Basic, valley	16.35
Basic, Pittsburgh	17.25
No. 2 foundry, valley	17.00 to 17.50
No. 2 foundry, Pittsburgh	17.90 to 18.40
Malleable, valley	17.00 to 17.25
Malleable, Pittsburgh	17.90 to 18.15
Gray forge, valley	16.25 to 16.50
Gray forge, Pittsburgh	17.15 to 17.40

Ferro-Alloys.—Several small lots of low grades of ferro-silicon have been sold at premium prices in this district during the last week or ten days. There has not been much demand for forward delivery. Ferro-manganese has not been active and no large sales of 50 per cent ferro-silicon are reported. Prices, however, appear to be more firm than they were a fortnight ago.

We quote 80 per cent ferro-manganese at $65, Baltimore, for prompt delivery and $65 for forward shipment. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted at $75, Pittsburgh, for prompt and forward delivery; 12 to 13 per cent, $26, 11 to 12 per cent, $25, 10 to 11 per cent, $24; 9 to 10 per cent, $23, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

On ferro-titanium we quote 8 cents per pound for carload lots; 10 cents per pound for 2,000 pound lots and over, and 12½ cents per pound in lots up to 2,000 pounds.

Plates.—Specifications against contracts for plates in February were heavier than those received the previous month, despite the fact that last month was three days shorter than January. The leading interest and independent companies are exceedingly optimistic about the future. Some interests are six months deferred in shipments.

Mills selling plates for prompt delivery state that demand is not so heavy as it was a fortnight ago, although consumers are willingly paying all the way from 1.60c to 1.90c for material, according to delivery. Local car builders have not received any especially large orders this week, but reports from the east indicate that this branch of the trade is active. The Pennsylvania railroad is inquiring for 317 passenger cars and the lines west are asking bids on 85 passenger and baggage cars. The following quotations continue to be firmly maintained:

Standard steel plates ¼ inch thick, 6¼ to 100 inches, 1.45c to 1.60c for forward shipment and 1.65c to 1.90c for prompt shipment. For extras, see card of Sept. 1, 1909.

Sheets.—The American Sheet & Tin Plate Co. advises that specifications and new orders in February were extremely heavy, and the month as a whole excelled February, 1912, one of the particularly good months last year. by a considerable margin. Although three days shorter than January, one of the best Januaries in the history of the sheet trade, February was as good a month, relatively speaking, from a standpoint of specifications and new orders.

All of the serviceable sheet mills are operating at maximum capacity. Some of the independent manufacturers who have been able to offer material for prompt delivery advise that they are unable to offer black or blue annealed sheets at this time, except for forward shipment. No. 28 gage galvanized sheets, for delivery within two or three weeks, are bringing $2 a ton above the price for future delivery. The following prices are being maintained:

Flat Sheets

Black Sheets.—Nos. 10-12 gage, $2 per 100 pounds; Nos. 13-14 gage, $2.05; Nos. 15-16 gage, $2.10; Nos. 17-21 gage, $2.15; Nos. 22-24 gage, $2.20; Nos. 25-26 gage, $2.25; No. 27 gage, $2.30; No. 28 gage, $2.35; No. 29 gage, $2.40; No. 30 gage, $2.50.

Tin mill sizes, Nos. 15-16 gage, $2.10 per 100 pounds; Nos. 17-21 gage, $2.15; Nos. 22-24 gage, $2.20; Nos. 25-27 gage, $2.25; No. 28 gage, $2.30; Nos. 29-30 gage, $2.35; Nos. 30¼-31 gage, $2.40; No. 32 gage, $2.45.

Blue Annealed.—Nos. 3-8, $1.70 per 100 pounds; Nos. 9-10, $1.75; Nos. 11-12, $1.80; Nos. 13-14, $1.85; Nos. 15-16, $1.95.

Galvanized.

Nos. 10-11 gage, $2.50 per 100 pounds; Nos. 12-14 gage, $2.60; Nos. 15-16 gage, $2.75; Nos. 17-21 gage, $2.90; Nos. 22-24 gage, $3.05; Nos. 25-26 gage, $3.20; No. 27 gage, $3.35; No. 28 gage, $3.50; No. 29 gage, $3.65; No. 30 gage, $3.80.

Roofing Sheets

Net extras on all gages per 100 pounds.

Corrugated 2-inch, 2½-inch, 3-inch and 5-inch corrugation, 5c; 2 V crimped without sticks, 5c; corrugated 1¼-inch corrugation, 10c; 3 V crimped without sticks, 10c; pressed

standing seam with cleats, 15c; plain roll roofing with or without cleats, 15c.

Painted Roofing.

12 to 18 gage, inc., 5c; 19 to 24 gage, inc., 10c; 25 to 28 gage, inc., 15c.

Tin Plate.—There has been a material increase the last couple of weeks in specifications for tin plate, although there has not been much, if any, new buying, due to the fact that consumers covered needs several months ago.

Until after stockholders of La Belle Iron Works, Steubenville, O., meet, March 11, to consider the advisability of entering into the merger with other tin plate companies, the proposed consolidation of independent tin plate mills in this district is not expected to offer new developments. The following prices prevail:

Coke tin plate, 100-pound basis, 14 x 20, $3.60, f. o. b. mill, Pittsburgh district.

Rails. — It is officially stated by mills rolling rails in this district that daily specifications against contracts during February were heavier than those of the preceding month, and if it were not for the fact that February is three days shorter than January, last month's specifications would have been slightly heavier than those of the preceding month. No particularly large orders have been placed with mills this week. There has been some new demand for standard spikes and specifying continues at a heavy rate. Jobbers are building up fairly large stocks and are maintaining prices in every instance. Rails are quoted as follows, with the base price of open hearth steel sections at 1.34c per pound, at the mills:

Fifty-pound and heavier, 1.25c per pound; carload and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.25c, the schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c, base, Pittsburgh; track bolts, 2.40c to 2.50c, base, Pittsburgh.

Railroad Spikes

4½, 5 and 5½ and 9-16	1.90c
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x 7-16	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x 5-16	.60
2 x 5-16	.80

Billets and Sheet Bars. — It is rumored that a sale of 1,000 tons of open hearth sheet bars at $31, mill, has been made, but it is impossible absolutely to verify this report. It is known, however, that a number of the heaviest consumers are actively negotiating for billets and sheet bars, although no sales of any consequence have been made.

Additional open-hearth capacity this year is expected to relieve the acute situation to a considerable extent, although some in the trade believe that no benefits will result, inasmuch as demand is increasing more rapidly than capacity. The following quotations, although nominal, represent the market as accurately as possible under existing conditions; the infrequency of sales makes it difficult to indicate the exact status of the market. We quote:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $29.00, with the usual rolling billets, $29.50. Bessemer sheet and tin bars are quoted at $29.50 and open-hearth sheet bars are quoted $30, f. o. b. Pittsburgh and Youngstown, with full freight to destination added. Forging billets are quoted at $36, Pittsburgh.

Hoops and Bands.—Specifications against contracts for both hoops and bands were exceedingly heavy last month, and makers have not been able to catch up in deliveries. Several interests are three and four months deferred in shipments. Prevailing quotations follow:

Hoops in carload lots, 1.60c to 1.70c, Pittsburgh, in less than carload lots, 1.65c to 1.75c; bands, 1.40c, base, with net extras, as per standard steel.

Merchant Bars.—Considerable talk has been heard in reference to efforts on the part of agricultural implement makers to obtain steel bar requirements for the season beginning July 1, 1913, and extending through the following 12 months. Leading steel bar manufacturers in this district advise that they have received no definite inquiries from the agricultural implement interests, although it is understood that the question has come up in a tentative way in the Chicago district. Makers state that specifications last month continued heavy, and several steel company officials say that February excelled the preceding month from the standpoint of actual specifications. Some makers are just beginning to ship material contracted for the latter part of September and October. Iron bars continue strong and demand for both prompt and future delivery has not fallen off. No change is noted in the situation for cold rolled shafting. Prices follow:

Common iron bars, 1.70c to 1.80c, Pittsburgh; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator 1.40c; channels, angles, zees, tees, under 3 inch, 1.50c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds and not less than 1,000 pounds of a size, 0.15 advance, less than 1.000 pounds of a size, 0.35. Cold rolled and ground shafting, 58 per cent off in carloads and 53 per cent in less than carloads delivered in base territory.

Muck Bar.—No change is noted in the muck bar market. This product is quoted nominally at $32, Pittsburgh.

Bolts, Nuts and Rivets.—Manufacturers of rivets complain about the difficulty of obtaining bars, although shipments are somewhat better than they were a month or six weeks ago. Rivets are strong at prevailing prices. Bolts and nuts are in good demand, although new orders are not so heavy as they were early this year. Mills have been unable, however, to catch up in deliveries. Prices continue firm, and jobbers are not shading the prevailing discounts in this district. Quotations follow:

Rivets

Button head structural rivets, 2.20c, Pittsburgh, cone head boiler rivets, 2.30c. Small rivets 75, 10 and 10 off.

Bolt and Nut Discounts.

(Delivered with a 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller and shorter, rolled threads, 75 and 10; cut threads 75 and 5; larger and longer, 70 and 2½.

Machine bolts with hot pressed nuts, ⅜ x 4 inches, smaller and shorter, rolled 75, 10, and 5; cut, 75 and 10; larger and longer, 70 and 7½.

Gimlet and cone point lag or coach screws, 80 and 10.

Hot pressed square, blank or tapped nuts, $5.70 off list; hot pressed hexagon blank or tapped, $6.30.

Cold pressed C. & T. square, blank or tapped, $5.70 off; hexagon, blank or tapped, ⅝-inch and larger, $6.60 off; ½-inch and smaller, $7.20 off.

Structural Shapes.—What has been said in reference to February plate specifications exceeding those of the previous months applies also to structural shapes. The American Bridge Co. has taken a contract for five new buildings at Messena, N. Y., involving 1,200 tons of steel for the Aluminum Co. of America. The McClintic-Marshall Construction Co. has taken an order through Hoover & Mason, Chicago, for an ore bridge at South Bethlehem for the Bethlehem Steel Co., involving 650 tons; 400 tons of coke oven bindings for the H. Koppers Coke Co., Chicago; 100 tons for a new bridge, Rochester, N. Y., for the New York Central railroad, and a small tonnage from the Samuel Austin & Sons Co., Cleveland, for roof, trusses and bracings at the Central Falls, R. I., plant of the General Electric Co. The McClintic-Marshall company also has been awarded a contract for auxiliary buildings for the Weirton Steel Co., Weirton, W. Va.

The Carbon Steel Co., this city, is asking bids on about 250 tons for a new universal mill building, 50 x 380 feet, to replace the present structure. The Thew Automatic Shovel Co., Lorain, O., will build extensions to the present buildings, involving a fairly heavy tonnage, and the Westinghouse Airbrake Co. tomorrow will award bids for the new two-story foundry, 50 x 300 feet, involving 500 tons. Several other inquiries, including those of the Pennsylvania Rubber Co., Jeannette, Pa., and the Otis Steel Co., Cleveland, are

still pending. The following prices prevail:

Standard structural shapes, 1.45c to 1.60c for forward shipment. For extras see card of Sept. 1, 1909.

Iron and Steel Pipe.—Demand for iron and steel pipe continues at a heavy rate, and mills are more deferred in shipments. Considerable complaint is heard from consumers, many of whom are sending personal representatives to confer with officials here in an effort to obtain material at the earliest possible date.

An Ohio pipe maker has taken an order for 700 tons of oil country goods, including drive pipe, casing and tubing, for shipment to that state. Several important inquiries are pending, and it is probable that a number of interesting orders will be taken shortly. Despite the fact that reports are heard of prices being shaded in some territories, discounts here are being well maintained. In fact, many in the trade have expected to see both iron and steel pipe advance the last two or three weeks. Discounts to jobbers, subject to the usual preferential discount to the larger buyer, are as follows:

Iron and Steel Pipe Basing Prices

STEEL.

	Black. Butt.	Galv. Butt.	Black. Lap.	Galv. Lap.
⅛, ¼ and ⅜ inch..	73	52½	..	..
½ inch	77	66½	..	..
¾ to 3 inch	80	71½	..	..
2 inch	..	..	77	68½
2½ to 6 inch	..	..	79	70½
7 to 12 inch.....	..	..	76	65½
13 to 15 inch	..	..	53	..

Extra Strong Plain Ends, Card Weight.

⅛, ¼ and ⅜ inch..	68	57½	..	..
½ inch	73	66½	..	..
¾ to 1½ inch	77	70½	..	..
2 to 3 inch	78	71½	..	....
2 inch	..	..	74	65½
2½ to 4 inch.....	..	..	76	67½
4½ to 6 inch	..	..	75	66½
7 to 8 inch	..	..	68	57½
9 to 12 inch	..	..	63	52½

Double Extra Strong Plain Ends, Card Weight.

½ inch	63	56½	..	..
¾ to 1½ inch	66	59½	..	..
2 to 2½ inch	68	61½	..	..
2 inch	..	..	64	57½
2½ to 4 inch	..	..	66	59½
4½ to 6 inch	..	..	65	58½
7 to 8 inch	..	..	58	47½

IRON.

⅛ inch	66	47	..	..
¼ inch	70	57	..	..
¾ to 2½ inch.....	73	62	..	..
2½ to 6 inch.....	..	..	71	62
7 to 12 inch.....	..	..	69	56
2 inch	..	..	69	59

Extra Strong Plain Ends, Card Weight.

⅛ inch	64	53	..	..
¼ inch	68	61	..	..
¾ to 1½ inch.....	72	63	..	..
2 and 2½ inch.....	73	64	..	..
2 inch	..	..	67	59
2½ to 4 inch.....	..	..	71	62
4½ to 6 inch.....	..	..	70	61
7 to 8 inch.....	..	..	64	54
9 to 12 inch	..	..	59	48

Double Extra Strong Plain Ends, Card Weight.

½ inch	58	50	..	..
¾ to 1½ inch.....	61	53	..	..
2 and 2½ inch.....	63	55	..	..
2 inch	..	..	56	50
2½ to 4 inch.....	..	..	61	55
4½ to 6 inch.....	..	..	60	54
7 and 8 inch.....	..	..	53	43

Plugged and reamed pipe is furnished at 2 points higher price either butt or lap weld.

The above discounts are for full weight pipe, subject to a variation of 5 per cent, merchant pipe, when specified, being furnished up to 6 inches at one point higher discount (lower price).

Boiler Tubes.—There has been an unusually heavy demand for locomotive tubes, and manufacturers are booking rather heavy tonnages. The price of iron boiler tubes has not been advanced this year, despite reports to the contrary. Discounts to jobbers follow:

IRON AND STEEL BOILER TUBES BASING PRICES.

(To Jobbers.)

	Steel.	Iron.
1¼ to 2 inch.....	60	48
2¼ inch	57	44
2½ and 2¾ inch.....	63	53
3 and 3¼ inch.....	68	55
3½ to 4½ inch.....	70	5[illegible]
5 and 6 inch.....	63	..
7 to 13 inch.....	60	..

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire.—Spring buying has not yet begun, and some manufacturers do not expect to see this trade come in for several weeks, because of the open winter which has led them to believe that outdoor work will not begin as early as was expected. Specifications against contracts have been rather heavy. Mills have been able to accumulate some surplus tonnage, and jobbers' stocks are in much better condition than they were at the beginning of the year. Rumors last week to the effect that wire products would be advanced March 1 proved to be without foundation. The following prices prevail:

Wire nails, jobbers' carload lots, $1.75, retailers' carload lots, $1.80; cut nails (western makers), jobbers' lots, $1.70; painted barb wire, jobbers' carload lots, $1.75; retailers' carload lots, $1.80, with 40c for galvanizing; plain wire to jobbers in carloads, $1.55; and to dealers, in carloads, $1.60; polished staples, $1.75; galvanized staples, $2.15.

Wire Rods.—No sales of wire rods have been made for several weeks, and several interests are unable to offer surplus tonnage. Bessemer and open-hearth wire rods are nominally quoted at $30, Pittsburgh.

Coke.—The coke market has been so quiet that it has been difficult to obtain quotations which actually represent conditions. In the Uniontown district a few days ago dealers were refusing to sell furnace fuel at $2.50, ovens; some dealers in this city at that time expressed the belief that it would be extremely difficult to obtain that figure for standard furnace coke. The market is quoted nominally at $2.50, ovens. One of the heaviest consumers has been negotiating for third quarter requirements, involving about 25,000 tons a month for shipments outside the immediate district. Consumers are offering to pay $2.25 for third and fourth quarter fuel, and it appears as if the market will finally settle somewhere between $2.25 and $2.50, ovens. Another record was established the week ending Jan. 22, when 441,645 tons of coke were produced, according to the *Conellsville Courier*. Production made a gain of 8,204 tons compared with the week before. Shipments increased 145 cars. The following nominal quotations prevail:

Connellsville furnace	$2.50
Connellsville furnace contract.....	2.50 to 2.75
Connellsville foundry	3.50
Connellsville foundry contract.....	3.50 to 3.75

Old Material.—A stronger tone is reflected by the market for old material, although prices have not yet advanced. Some of the heaviest consumers of iron and steel scrap in this district have entered the market during the past week, and one of the leading independent companies has bought considerable heavy melting steel at $14.50. Middlemen have been selling heavy melting steel at $14.50, delivered in this district, although small lots continue to be obtained at $14.25. One of the larger dealers in this district has offered to pay the latter figure for good quality heavy melting steel. Machine shop turnings continue weak, and considerable difficulty is being experienced in moving low phosphorus scrap. Mills are refusing to pay prevailing prices for this material, although dealers have not yet showed any desire to offer lower figures. Quotations this week are as follows:

Heavy melting scrap	$14.25 to 14.50
Rerolling rails	16.50 to 17.00
Malleable	14.00 to 14.50
Agricultural malleable	12.75 to 13.00
Bundled sheet scrap.....	11.75 to 12.25
Iron axles	26.00 to 26.50
Old iron rails.....	16.25 to 16.50
Stove plate	11.00 to 11.50
No. 1 wrought scrap.....	15.25 to 15.50
Old car wheels.....	16.00 to 16.50
Low phosphorus	18.00 to 18.25
Machine shop turnings.....	9.25 to 9.75
No. 1 busheling	14.00 to 14.50
Country mixed	10.75 to 11.00
Cast borings	10.25 to 10.50
No. 1 cast scrap.....	14.75 to 15.00

Resumes Iron Agency.—Crocker Bros., New York City, have resumed their relations with the Emporium Iron Co., Erie, Pa., as sole agents for the sale of the product of foundry pig iron made by this furnace interest. The selling agency of this company has recently been handled by J. K. Dimmick & Co., Philadelphia. Prior to that time, Crocker Bros. had acted as the agent for this furnace for a term of years.

CHICAGO

Mills Flooded With Specifications

Office of THE IRON TRADE REVIEW,
1328 Monadnock Blk., March 4.

The mills in the west are being flooded with specifications at a rate that is causing considerable comment. Some reports have been received to the effect that 60 per cent of the contract obligations in this territory have already been specified. Should the amount of business received by the steel mills continue at the rate established during the past two months, this year will establish a record far exceeding any previous one. Business in bar iron is equally good, the total specifications booked for each of the last three months being greater than the one before. In contrast with these prosperous indications, the market for cast iron pipe is very dull and prices have been reduced $1 a ton. Structural rivets are also weak, current quotations being nominal. Sheets seem to be somewhat firmer than they have been for some weeks past.

Pig Iron.—In spite of the maintenance of low quotations from some southern furnace interests, the market for local iron seems to be a little firmer. Local consumers appear to be more confident, although the general disposition of buyers still is to hold off as long as possible. As the time approaches when furnace books must necessarily be filled for the second half, it becomes even more a question of the relative sticking qualities of producers and consumers. No sale of contract tonnage for future delivery by any northern interest is noted at less than $18 f. o. b. furnace and an indication that this price is being fairly well maintained is found in the fact that an Ohio interest recently sold 1,000 tons to an Illinois consumer in the negihborhood of $18.25, delivery in Chicago. The three largest Birmingham interests are still quoting $14 to $14.50, Birmingham, such small sales for prompt delivery as have been made at less than the former figure being resale iron, some of which went at $13.

Although the bulk of the inquiry is still of a tentative nature, some fairly good inquiries are noted and sales involving good tonnages have been made. A Wisconsin melter has taken 1,500 tons of malleable iron and a buyer in the same district has taken 1,500 tons of charcoal iron. It is understood that these sales were made at current quotations. The Lindemann & Hoverson Co. is in the market for 500 tons of foundry iron and the Central City Iron Works, Stevens Point, Wis., is inquiring for a small tonnage. Another inquiry for from 1,000 to 1,500 tons of foundry iron from an Illinois consumer is noted. A melter in Racine, Wis., has asked for quotations on 100 tons of foundry iron for prompt delivery. It is understood that the Lindemann & Hoverson inquiry is for iron for delivery during the second quarter.

The following prices represent the market for first half for Chicago delivery except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnaces.

Lake Superior charcoal	$18.00 to 19.25
Northern foundry No. 2	17.50 to 18.00
Southern foundry No. 2	17.35 to 18.10
South'n Silveries, 5 per cent sil.	19.85
Jackson co. silveries 8 per cent	21.40
Malleable Bessemer	17.50 to 18.00
Alabama basic	18.85

Merchant Bars.—Although it is probable that agricultural interests will cover for their requirements earlier than usual, nothing of this nature has been done as yet. In some cases, however, over-specification against existing contracts has been permitted, enabling consumers to take enough tonnage in this way to supply their immediate needs and to run through a part of the third quarter. Prices on iron bars remain firm at current quotations, this being equally true of steel. It is impossible to obtain prompt delivery on soft steel bars without paying heavy premiums and in many cases this expedient is ineffective.

We quote, f. o. b. Chicago, as follows:

Bar iron 1.60c to 1.62½c; hard steel bars, rerolled, 1.65c to 1.75c; soft steel bars, bands and small shapes, 1.63c; hoops, 1.63c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting 58 per cent off list for carload lots, 53 per cent off for less than carloads.

On iron and steel from local stock we quote as follows:

Bar iron, 1.95c per pound base; soft steel bars, 1.95c per pound base; soft steel hoops, 2.50c, full extras.

Structural Material.—The surprising total of specifications received by western mills includes heavy tonnages of this material and jobbers find that the demand upon them is even larger than it has been for previous months. The railroads are consuming heavy tonnages of shapes, having taken over 50 per cent of the total contracted for during the past week. This amount includes 1,263 tons let by the Chicago, Burlington & Quincy Railroad Co. to the American Bridge Co., for various girders, 396 tons let by the Wabash Railroad Co., to the same fabricator for girder spans and 205 tons let by the Chicago, Rock Island & Pacific Railway Co. to the Kenwood Bridge Co., for a grain elevator at Kansas City, Kan. The leading interest has also taken 129 tons from the Puget Sound Bridge & Dredging Co., for one 160-foot through pin span at Aberdeen, Wash. The Lackawana Bridge Co. has taken 159 tons from the American Radiator Co., for remodeling work on the Holland plant at Bremen, Ind., and the Kansas City Structural Steel Co. has taken 160 tons from Louis Oppenstein for a theater building at Kansas City. The McClintic-Marshall Co. has taken 418 tons from H. Koppers Co., Chicago, for gas and coke ovens at Youngstown, O. The city of Chicago has let a contract for 232 tons for the erection of the Wilson avenue. bridge.

We quote, f. o. b. Chicago, as follows:

Beams and channels, 15 inch and under, 1.68c. For extras, see Pittsburgh report.

Store prices are as follows:

All angles, 3 inches and larger, including 6 inches, $2.05 per 100 pounds; angles over 6 inches, $2.15 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $2.05 per 100 pounds, base; channels, 3 inches and larger, $2.05 per 100 pounds, base.

Rails and Track Fatsenings. — No new rail business has been reported recently, but specifications are very heavy and indications point to a heavy run of business later in the year. The mills of the Corporation are well filled and in many cases Bessemer rails are being specified in order to obtain more prompt delivery. It is becoming evident beyond question that the raw steel capacity is inadequate, as indicated by decision of the corporation to increase the number of furnaces at Gary. Prices of track fas-

tenings have been shaded by some independents.

We quote light rails, f. o. b. Chicago, as follows:

Light rails, carloads, 25 to 45-pound, 1.30c; 16 to 20-pound, 1.35c; 12-pound, 1.40c; 8-pound, 1.50c.

Light section relayers, 45 pounds and under, subject to inspection, $22 to $24; standard section relaying rails, subject to inspection.

Track fastenings, f. o. b. Joliet, are as follows:

Angle bars, 1.50c; railroad spikes, 1.95c; smaller size spikes, 1.75c, base; track bolts with square nuts, 2.30c to 2.40c.

Plates. — The Chicago & Western Indiana is in the market for 300 ballast cars, and the Chicago, Rock Island & Pacific has ordered 50 caboose cars from the Whipple Car Co. The Cincinnati, New Orleans & Texas Pacific has ordered 100 gondola cars and 50 hoppers from the Cambria Steel Co., 100 box cars from the American Car & Foundry Co. and five dining cars from the Barney & Smith Car Co. The Pennsylvania railroad has ordered 1,000 refrigerator and 500 steel and wood gondola cars from the American Car & Foundry Co., and 805 steel and wood gondola cars from the Standard Steel Car Co. The correct division of the recent order placed by the Harriman Lines is announced as follows: 2,800 drop bottom gondola cars, 200 hopper bottom gondola cars and 203 tank cars from the Pressed Steel Car Co., 1,000 box cars, 800 automobile cars and 110 caboose cars from the Standard Steel Car Co.; 2,290 box cars from the American Car & Foundry Co.; 2,050 single deck stock cars and 3,100 box cars from the Pullman Co., and 800 work cars and 500 flat cars from the Bettendorf Axle Co.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6⅝ to 100 inches wide, 1.68c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, $2.05.

Bolts, Nuts and Rivets.—The nominal quotation for rivets continues to be 2.20c, Pittsburgh, in this territory, but the market is being shaded considerably by a number of producers. Bolts and nuts, however, are firm and business continues at a satisfactory rate.

We quote prices on bolts, nuts and rivets as follows:

Rivets

Structural rivets, ¾ to 1¼ inches, 2.38c, base, Chicago, in carload lots; boiler rivets, 0.10c additional.

Bolt and Nut Discounts

Carriage bolts up to ⅜ x 6 inches, rolled thread, 75-10; larger sizes, 70-2½.

Machine bolts, up to ⅜ x 4 inches, rolled thread, 75-10-5; cut thread, 75-10; larger sizes, 70-7½.

Hot pressed nuts, square head, $5.70 off per cwt.; hexagon, $6.30 off per cwt.

Sheets.—While the larger producers are firmly maintaining the market quotations on this material, some of the smaller mills are still inclined to quote lower prices. This condition, however, does not affect the market in any material degree, as it is more or less of a custom for the smaller producers to quote lower prices than their larger competitors. Store business is unusually good and but little difficulty is being experienced in taking care of customers.

We quote, f. o. b. Chicago, as follows:

Blue annealed, No. 10, 2.25c; No. 12, 2.20c. Box annealed, No. 28, 2.90c. Galvanized No. 28, 4.15c.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Wire Products.—Although a seasonable dullness is apparent in a slight degree, buying throughout the country continues at a good rate. This business is well distributed throughout all lines, both manufacturers and jobbers specifying for good tonnages.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.93; retailers' carload lots, $1.98; retailers' less than carload lots, $2.03; painted barb wire, jobbers' carload lots, $1.93; retailers' carload lots, $1.98; retailers' less than carload lots, $2.03, with 40c for galvanizing; plain wire, jobbers, carload lots, $1.73; retailers' carload lots, $1.78.

Merchant Pipe and Tubes.—Activity in this market is at about the same rate as has been maintained for previous weeks. Some dullness, due to the season of the year, is apparent and, in contrast, the rush of business for some months past, is very welcome to makers in this territory.

We quote, f. o. b. Chicago, as follows:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
Butt.				
⅛ inch and ¼ inch.	69.2	48.2	62.2	42.2
⅜ inch	73.2	62.2	66.2	....
¼ inch to 1½ inch	76.2	67.2	69.2	57.2
Lap.				
2 inch	73.2	64.2	65.2	54.2
4½ inch to 6 inch..	75.2	66.2	67.2	57.2
Card Weight.				
7 inch to 12 inch...	72.2	61.2	65.2	54.2
Extra Strong Plain Ends.				
Butt.				
⅛, ¼, ⅜ inch.....	64.2	52.2	58.2	46.2
½ inch	69.2	57.2	63.2	51.2
2 inch to 3 inch....	74.2	62.2	....	....
Lap.				
2 inch	70.2	58.2	64.2	52.2
7 inch to 8 inch...	64.2	52.2	58.2	46.2
Double Extra Strong.				
Butt.				
½ inch	57.2	45.2	....	....
¾ inch to 1½ inch.	60.2	48.2	....	....
Lap.				
2 inch	58.2	48.2	....	....
4½ inch to 6 inch..	59.2	47.2	....	....
7 inch to 8 inch....	52.2	40.2	....	....

Tubes

Diameter.	List price.	Lap weld steel, per cent off.	Charcoal iron, per cent off.	Cold seamless, per cent off.
1	30	..	..	57½
1¼	28	..	..	52½
1½	27	..	..	47½
1¾	22	51	40	35
2	20	51	40	35
2¼	22	51	36	35
2½	28	56	43¼	40
2¾	31	56	43¼	40
3	34	61	47	46
3¼	40	61	47	46
3½	43	63	40	46
4	55	63	50	46
5	76	56	..	..
6	102	56	..	..

Cast Iron Pipe.—Current quotations from municipalities for this material are very light and in consequence the market has fallen off $1 a ton, 4-inch water pipe now being quoted at $30. Some business is being negotiated, however, the city of Chicago having closed bids on 5,000 tons of pipe. Grand Rapids, Mich., has let a contract for 1,000 tons of pipe to the Lynchburg Foundry Co., and Minneapolis closed bids on 1,200 tons of water pipe on Monday. The market for cast iron pipe seems to be rather weak, the difficulty experienced by municipalities in placing bonds at par being given as one of the contributing causes. The continuance of present conditions would result in further declines.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $31, 6 to 12 inches, $29, larger sizes, $28, gas pipe, $1 a ton higher.

Old Material.—Indications at present seem to be that prices of scrap have slumped beyond hope of early recovery. Further declines are apparent this week, the weakest items being old steel rails, re-rollers and steel car axles. We quote for delivery in consumers' yards, Chicago, as follows:

Gross Tons

Old car wheels	$16.75 to 17.25
Old iron rails	16.25 to 16.75
Rerolling rails (5 ft. and over)	15.00 to 15.50
Old steel rails (3 ft. and und.)	13.75 to 14.25
Frogs, switches and guards	12.25 to 12.75
Heavy melting steel	12.50 to 13.00
Shoveling steel	12.00 to 12.50

Net Tons

No. 1 R. R. wrought	$12.00 to 12.50
No. 2 R. R. wrought	11.25 to 11.75
Arch bars and transoms	16.25 to 16.75
Knuckles, couplers and springs	12.75 to 13.25
Shafting	16.50 to 17.00
Iron car axles	21.25 to 21.75
Steel car axles	18.75 to 19.25
Locomotive tires	13.50 to 14.00
Dealers' forge	10.50 to 11.00
Pipe and flues	8.75 to 9.25
No. 1 cast	13.25 to 13.75
No. 1 busheling	10.25 to 10.75
No. 2 busheling	7.75 to 8.25
No. 1 boiler cut	9.25 to 9.75
Boiler punchings	13.00 to 13.50
Cast and mixed boring	6.75 to 7.25
Machine shop turnings	7.75 to 8.25
Railroad malleable	13.00 to 13.50
Agricultural malleable	12.25 to 12.75
Angle bars, splices, etc., iron	16.50 to 17.00
Angle bars steel	11.50 to 12.00
Stove plate and light cast scrap	11.00 to 11.50

CLEVELAND

Ore Shippers Protest Against Railroad Charge

Office of THE IRON TRADE REVIEW,
Penton Bldg., March 4.

Iron Ore.—The railways carrying ore to Escanaba, Ashland and Marquette have issued their tariffs for the year 1913, which work out at an increase of 5 cents and more over the tariffs of preceding years. The rail rate, strictly speaking, is not increased at all, but the haul applies only to dock yards and furnace tracks. Where the ore is for vessel delivery for points beyond, it will be subject to the following additional charges:

> Storage in cars at dock yards, unloading from cars to docks, storage in docks and loading from docks to vessels:—If loaded into vessels within ten days from arrival of cars at dock yards, 5 cents per gross ton of 2,240 pounds.
>
> When not loaded into vessels within ten days, a storage charge (same will not be made during the closed season of lake navigation, i. e., the interval between departure of the last vessel and arrival of the first vessel); for each day or fraction thereof, ¼ cent per ton of 2,240 pounds per day after the first ten days.

These tariffs were put into effect by the railways during the latter part of February and include the Chicago & Northwestern railway serving Escanaba and Ashland, the Chicago, Milwaukee & St. Paul railway serving Escanaba; the Soo Line railway serving Ashland; the Duluth, South Shore & Atlantic railway serving Marquette, and the Lake Superior & Ishpeming railway serving Presque Isle.

It was reported a few weeks ago that the railways had decided not to impose this additional charge, but that was an error. They had decided to impose a charge of 5 cents per gross ton for the second ten days that the ore remained at the dock yard, but this charge was later withdrawn and the charge of ¼ cent per ton per day substituted in place of it.

Corrigan, McKinney & Co., Cleveland, have made an independent issue of the matter and have submitted protest against the charge to the Interstate Commerce Commission at Washington, as well as to the state commission. The ore shippers as a body also have met and considered the subject of concerted action against the increase, but have reached no conclusion.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.40; Mesabi Bessemer, $4.15; old range non-Bessemer, $3.60; Mesabi non-Bessemer, $3.40.

Pig Iron. — Agencies having furnaces in the valley, Toledo, Detroit and Buffalo report improvement in sentiment and indications that the buying movement will probably be started at a not far distant date. In the city of Cleveland, business continues at a standstill with quotations nominal. This condition is attributed to the fact that foundries are well supplied for their immediate needs and it is not expected that any considerable tonnage will be sold for delivery prior to July 1, although some foundries will probably buy moderate tonnages for May and June delivery. Cleveland melters, even if they needed iron, and were willing to buy for last half, would hesitate at the present time, when iron made in Cleveland is being offered for sale at distant points at very low prices, although quotations for delivery inside the city limits are being well maintained. Unless a strong buying movement sets in soon, lower quotations will probably prevail in the city. For the first half of this year, we quote as follows, delivered Cleveland:

No. 1 foundry	$17.75 to 18.00
No. 2 foundry	17.25 to 17.50
No. 2 southern	17.35 to 17.85
Bessemer	18.15
Lake Superior charcoal	19.10
Silveries 8 per cent siilcon	21.55
Bessemer ferro, 14 per cent	29.55

Finished Material.—Mills in Cleveland and Pittsburgh districts report that the volume of unfilled tonnage on shapes, bars and plates does not decrease. There has been some reduction in unfilled tonnage of wire and tubular goods. Eastern Pennsylvania mills are selling structural material at 1.65c, mill, or 1.85c, Cleveland, and on some sizes, are able to give deliveries in from two to six weeks. On small tonnages for prompt delivery, as high as 1.75c, eastern mill, is being paid. Eastern Pennsylvania mills are quoting 1.60c on sheared and 1.65c on universal plates at the mill for western shipment, and the volume of business has shown little, if any, decrease. The demand for nuts and bolts continues strong, and buyers of hoops and bands are finding difficulty in placing orders for anything that approaches early delivery. Some makers will not promise delivery before the fourth quarter. The Carnegie Steel Co. has taken an order for 20,000 steel ties from the Cleveland Railway Co. The Toledo Railways & Light Co. is inquiring for 1,750 tons of 100-pound rails and 660 tons of 70-pound rails. An industrial company is in the market for 200 tons of standard open-hearth rails and is having some difficulty in placing the order for the early delivery desired.

Old Material. — General conditions in old material market in Cleveland are improved. Cast borings are scarce and in demand. Heavy melting steel and No. 1 busheling are about steady and fair. A condition new in this market is a higher price for borings than machine shop turnings. The latter are down $1 to $5.50, while cast borings are firm at $7 to $7.50. Machine shop turnings are a drug. Consumers are using only the normal, but shops are producing the turnings in unprecedented quantities. Foundries are using No. 1 machine cast in quantities. Three railroad lists close today, the Wheeling & Lake Erie in Cleveland, and the New York Central and the Erie in New York City.. The Pennsylin New York City. The Pennsylvania Lines West close March 5 in Pittsburgh. Quotations follow:

Gross Tons

Old iron rails	$15.50 to 16.50
Old steel rails (under 3 ft.)	14.50 to 15.00
Old steel rails (over 6 ft.)	15.50 to 16.50
Relaying rails	27.00 to 28.00
Old steel boiler plate	11.00 to 11.25
Malleable iron (railroad)	14.50 to 15.00
Steel axles	19.50 to 20.00
Axle turnings	10.00 to 10.50
Malleable iron (agricultural)	11.50 to 12.00
Heavy steel	12.50 to 13.00
Country mixed steel	11.00 to 11.50
Bundled sheet scrap	11.00 to 11.50

Net Tons

No. 1 R. R. wrought	$13.00 to 13.25
No. 1 busheling	11.50 to 12.00
No. 1 machine cast	12.50 to 13.00
No. 1 dealers' wrought	10.50 to 11.50
Machine shop turnings	5.50 to 6.00
Pipes and flues	9.00 to 9.50
Wrought drillings	6.50 to 7.00
Cast borings	7.00 to 7.50
Stove plate	9.00 to 9.50
Wrought iron arch bars	17.00 to 17.50
Wrought iron piling plate	16.00 to 16.50

CINCINNATI

Low Prices Do Not Stimulate Business

Office of THE IRON TRADE REVIEW,
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Pig Iron.—Recent transactions have indicated that the minimum furnace price for southern No. 2 foundry iron is $13, Birmingham basis, for first half shipment, and that $13.25, Birmingham, can now be done for the whole of the present year. This lower priced iron, though, is confined entirely to Tennessee furnaces, as the Alabama stacks are generally holding for $13.50, Birmingham, for the first half, but they would probably accept business for the second half also at this figure. Southern resale iron, which is composed almost wholly of No. 2 foundry, is still obtainable in lots of varying sizes at $13, Birmingham basis, for immediate shipment.

Although southern Ohio furnaces as a general rule are still holding at $16.50, Ironton, for No. 2 foundry iron for any delivery this year, a few sales have recently been made as low as $16, Ironton, for this grade, and also for malleable, with shipments to extend into the second half. There is probably a little more resale iron to be had from this district than in the south, and it is being offered at $16, Ironton, for nearby delivery.

Despite these attractive prices, business in either district has not shown any improvement during the past week. There is very little general inquiry, and transactions are usually for small tonnages. A recent inquiry from a local melter for 500 tons of northern and 500 tons of southern iron, delivery to extend into the second half, has been postponed for 30 days, and another local melter has come out for 500 tons of No. 4 foundry iron for shipment up to next July. A Michigan melter is also inquiring for 1,000 tons of low phosphorus iron for the rest of the year. With freight rates $3.25 from Birmingham, and $1.20 from Ironton, we quote Cincinnati prices for the second quarter and second half as follows:

Southern foundry No. 1	$16.75 to 17.25
Southern foundry No. 2	16.25 to 16.75
Southern foundry No. 3	15.75 to 16.25
Southern foundry No. 4	15.50 to 16.00
Southern gray forge	15.25 to 15.75
Mottled	15.25 to 15.50
Southern No. 1 soft	16.75 to 17.25
Southern No. 2 soft	16.25 to 16.75
Standard southern car wheel	27.25 to 27.75
Southern Ohio No. 2	17.20 to 17.70
Southern Ohio No. 3	16.70 to 17.20
Southern Ohio No. 4	16.45 to 16.95
Silveries 8 per cent silicon	20.70 to 21.20

Coke.—The coke market is very unsettled and a wide range is being quoted between the leading brands in several of the fields. There are no large lots being sold and heavier business is not expected before another month at least. In the meantime, the only orders being placed are those to fill in until buying for the second quarter and the second half will begin, probably about April 1. Some Connellsville furnace coke was sold last week as low as $2.35 a ton, ovens, and the same price was made in the Wise county district on prompt furnace coke. There are rumors also that $2.25 has been done on 48-hour grades in this latter district recently. The Pocahontas and New River districts are probably a little more settled than the others. There has been a good tonnage offered here for the past few days at $2.50 a ton, for Pocahontas coke, but none of the ovens there will accept it at these figures. We quote below from the leading coke producing districts as follows:

	Prompt shipment.	Contract.
Connellsville district:		
Foundry coke	$3.25 to 3.50	$3.50
Furnace coke	2.50 to 3.00	2.35 to 3.00
Wise county district:		
Foundry coke	$3.25 to 4.00	$3.00 to 3.50
Furnace coke	2.35 to 3.00	2.50 to 3.00
Pocahontas district:		
Foundry coke	$3.25 to 3.75	$3.25 to 3.75
Furnace coke	2.50 to 2.75	2.75 to 3.00
New River district:		
Foundry coke	$3.25 to 4.00	$3.25 to 4.00
Furnace coke	2.90 to 3.10	2.90 to 3.10

Finished Material.—The congested condition of the local sheet mill has not been relieved to any extent and it is still about 13 weeks behind on deliveries. Premiums are being offered for deliveries up to within four weeks from the date of sale, but they are being refused, as new orders at the present time about equal the mill's output. Prices are as follows, Pittsburgh basis: Black sheets, No. 28 gage, 2.35c, and galvanized sheets, No. 28, 3.50c.

Several new buildings of considerable size in this territory, that will be begun this spring, will be built of materials from the warehouses, as the mills cannot deliver in most cases before next fall. For this reason, warehouse business is good, and in some cases, stocks on hand are badly depleted. One large house has advanced prices 5 cents per 100 pounds on bars, beams, channels and plates. We quote warehouse prices, f. o. b. Cincinnati as follows:

Steel bars, 2.10c to 2.20c, base; iron bars, 2.05c to 2.15c, base; structurals, 2.10c to 2.25c, base; plates, ¼ inch and over, 2.15c to 2.25c, base; sheets, blue annealed No. 10, 2.25c to 2.90c, base; rivets, cone head 2.60c to 2.70c, base; cold rolled shafting, 58 to 55 per cent off on round, and 55 to 50 per cent discount on flat, square and hexagon; steel hoops, 2.10c to 2.20c, base; full extras; boiler tubes as follows: 1½ inch, 46 per cent discount; 1¾ to 2¼ inch, 57 per cent discount; 2½ inch, 60 per cent discount; 2¾ to 3¼ inch, 65 per cent discount; 3½ to 4½ inch, 68 per cent discount; 5 to 6 inch, 60 per cent discount; soft steel cold twisted concrete bars, cut to length as follows: ¾ inch square and larger, 2.15c to 2.25c; ⅝ inch square and larger, 2.25c to 2.35c; ½ inch square and larger, 2.35c to 2.45c; 5-16 inch to ⅜ inch square and larger, 2.25c to 2.65c; and ¼ inch square and larger, 2.65c to 2.75c.

Old Material.—Despite the fact that scrap iron prices have been declining steadily since the first of the year, and are now generally about a dollar lower than they were at that time, the demand has not increased to any extent, and buyers continue to ask concessions for contract business in proportion to the decline of the market up to the present time. Stove plate has shown a little strength during the past week, and has sold in small lots in several cases at prices slightly above the general quotations. Price fluctuations are common, as dealers are buying and selling mostly without regard to the general level of the market, and in cases of this kind quotations are governed mostly by the conditions and deliveries of the transactions. We quote below prices dealers will pay and also dealers' selling prices in Cincinnati and vicinity, as follows:

Gross Tons

Old iron rails	$13.00 to 13.50
Old steel re-rolling	11.50 to 12.00
Old iron axles	17.50 to 18.00
Heavy melting scrap	11.00 to 11.50
Relaying rails	20.25 to 20.75
Bundled sheet scrap	8.50 to 9.00

Net Tons

Old No. 1 R. R. wrought	$10.25 to 10.75
No. 1 yard wrought	8.25 to 8.75
No. 1 machine cast	10.50 to 11.00
No. 1 busheling	8.75 to 9.25
Stove plate	7.75 to 8.25
Machine shop turnings	6.50 to 7.00
Cast borings	6.75 to 7.25
Heavy turnings	7.00 to 7.50
Mixed cast	9.00 to 9.50
Breakage	6.75 to 7.25
Malleable	8.50 to 9.00

PHILADELPHIA

Pig Iron Interest Revives---More Finished Tonnage

Office of THE IRON TRADE REVIEW,
Philadelphia, March 4.

The development of the greatest interest in the eastern Pennsylvania and surrounding district the past week has been the revival of buying in the pig iron market. Sales of about 20,000 tons of various grades have been closed with low grade iron for the cast iron pipe makers, figuring heaviest. The nominal basic market in the east, which had ruled $18, delivered, for weeks, has been cleared by a sale of 3,000 tons for third quarter at about $17.75, delivered. Another sale of 3,000 tons for last half to a Cumberland, Md., consumer, went to an Ohio producer at about the same price. Pig iron prices in general are still soft. A fresh impulse of new business in finished products was noted by eastern mills the past week. As a result, deliveries in plates and shapes, which had been becoming easier, are again being extended. Finished prices remain very staple. The scrap market is more stationary after the long decline. While buyers are giving the market more attention, new orders remain light.

Pig Iron.—An improvement in sentiment in the pig iron market reported a few weeks ago proves to have been the precursor of a considerable expanse this week in buying and new inquiry in the eastern Pennsylvania and surrounding districts. Buyers are now coming into the market more freely and are asking for considerable tonnage additional for second quarter shipment, which strengthens the belief that a good deal of iron will yet be needed for delivery this side of July. As is not unusual in a reviving market, low grade iron shows the heaviest immediate demand. Practically all the cast iron pipe makers in the eastern Pennsylvania and Virginia territories have come into the market either by formal inquiry or through quiet offers for round lots of low silicon iron. A Lynchburg, Va., shop has closed for about 7,500 tons of forge and No. 3 grades for second quarter delivery. Virginia makers obtained the bulk of the business, but some of it is understood to have gone to Alabama producers. The Virginia metal is reported to have been taken around the full price of $14.75, furnace, for forge. Another Lynchburg interest is inquiring for 1,200 tons of forge and No. 3 for April-May and is expected to buy 3,000 to 4,000 tons for second quarter. In the eastern Pennsylvania district, one pipe maker took 2,000 tons of northern off-grades from a Lehigh valley maker. Pipe iron along the Delaware river district is quotable at from $16 to $16.50, delivered. In rolling mill forge, an eastern consumer took 500 tons of prompt northern iron at $17, delivered, and about the same tonnage of southern forge at a considerably lower price. Buying of foundry iron is still slow. Prices of No. 2X, Philadelphia, have settled to about $18, though one central Pennsylvania maker, especially anxious for business, has offered its brand at $17.80, this district, or $16, furnace. A sale of eastern Pennsylvania No. 2 plain at $17.65, delivered, is noted. A central Pennsylvania radiator manufacturer is inquiring for 1,000 tons of No. 2X for second quarter. The eastern basic market, which has been nominal in price for some weeks, has been cleared somewhat by developments this week. A central Pennsylvania consumer closed for 3,000 tons for third quarter at about $17.75, delivered, from an eastern maker. A Cumberland steel maker took 3,000 tons of this grade for last half at approximately $17.75, delivered. The iron, it is understood, will come from an Ohio maker at $16.25 to $16.35 at the furnace. Leading basic buyers in the eastern Pennsylvania district will probably be able to do $17.50, delivered, on basic, according to the latest developments. Small sales of low phosphorus are being made at unchanged prices. The new Oriskany furnace at Lynchburg, Va., will probably blow in next month.

An eastern steel maker has purchased 500 tons of prompt Bessemer at a reported price of about $19.25, delivered, the business going to an eastern maker.

We quote for prompt and first quarter shipment delivered to consumers' plants, in Philadelphia and vicinity, as follows:

Eastern Pa. No. 1X foundry	$18.25 to 18.50
Eastern Pa. No. 2X foundry	18.00 to 18.25
Eastern Pa. No. 2 plain	17.75 to 18.00
Standard forge (Eastern Pa.)	16.75 to 17.00
Basic (Eastern and Central Pa.)	17.75
Virginia No. 2X	18.30 to 18.55
Southern No. 2	17.50 to 18.00
Malleable	19.25 to 19.50
Standard low phos. Phila.	24.50

Iron and Steel Bars.—Local mills are quoting steel bars for prompt shipment at 2c, Philadelphia, jobbers' prices are slightly higher and one eastern Pennsylvania mill has been selling regular carbon open-hearth bars for immediate shipment at 2.25c to 2.50c, mill. The continuance of such prices for prompt delivery will demonstrate the unchanged condition in this product in which deliveries with all the leading makers remain long extended and there is no sign of relaxation in the demand. The larger makers are not quoting on new business before the third quarter. Eastern Pennsylvania bar iron makers are continuing their price at 1.60c, mill, and are entering considerable tonnage, though orders at premiums have practically disappeared.

We quote for delivery to consumers' plants in Philadelphia and vicinity: Steel bars at 1.55c to 1.60c on contract and common bar iron at 1.65c to 1.75c. Prompt steel bars on mill shipments are quoted at 1.85c to 2.00c delivered, and from store are quoted at 2c to 2.15c, delivered. Cut nails are quoted from 1.90c to 1.95c, Philadelphia. Shafting is quoted at 58 and 53 off in base territory.

Plates.—New business with eastern Pennsylvania plate makers showed a considerable expanse in the past week and deliveries, which recently have been easier, are again lengthening. Shipments in general still run from four to six weeks, but some makers are not promising material under the maximum period. The new tonnage with mills exceeds shipments. Prices with eastern makers remain firm at 1.60c, Pittsburgh, for sheared, and 1.65c, Pittsburgh, for universals, or 1.75c to 1.80c, Philadelphia, respectively. Some second quarter contracting continues to be done at these levels, including one lot of 3,000 tons. Bridge plate specifications are good. The Pennsylvania railroad has ordered the material from an eastern mill, about 1,000 tons, for the building of 80 locomotives in its own shop at Altoona. Bids go in this week on 250 tons for riveted pipe construction, Panama canal. Eastern boat builders are still bidding upon six vessels of good size.

We quote delivered to consumers' plants in Philadelphia and vicinity: Sheared steel plates on contract, 1.60c to 1.75c; universal plates on contract, 1.60c to 1.80c; sheared plates

for early delivery, 1.75c to 1.85c; universal plates for early delivery, 1.80c to 1.85c. Plates from store are quoted at 2.15c to 2.25c, delivered.

Structural Shapes.—Makers of shapes in the eastern Pennsylvania district report an increased volume of new orders the past week. These have usually been small, singly, but the aggregate is considerable; so that, with some mills a recent gain in deliveries has been overcome and shipments in these cases are back to eight to ten weeks. One eastern mill, which has been offering standards at 1.50c, Pittsburgh, has notified the trade its price is again 1.60c, Pittsburgh, or 1.75c, Philadelphia, at which several makers continue to hold. At least one maker, however, will still accept the 1.50c, Pittsburgh price on sizable lots. On stock orders the mills generally quote 1.75c at the plant. The Belmont Iron Works has taken about 1,500 tons for a pier to be built at the Panama canal. The Keystone Structural Steel Co. has 200 tons for an addition to the plant of the J. G. Brill Co., this city. The Y. M. C. A. building, Atlanta, Ga., has gone concrete. The office building on South Penn square, 2,200 tons, continues to be refigured. Bids will shortly be asked for a large coal pier for the Carolina, Clinchfield & Ohio railroad, at Charleston, S. C., which will require 4,000 to 5,000 tons. The Georgia railroad is planning similar construction at Savannah. Reports from the southeast indicate a very liberal tonnage of fabricated steel is in prospect from plans now in formulation.

We quote for delivery to consumers' plants in Philadelphia and vicinity: Structural shapes on contract, 1.60c to 1.75c; for early delivery, 1.80c to 2.00c; from warehouse stocks, 2.15c to 2.25c.

Semi-Finished Steel.—Consumers of semi-finished steel outside the eastern Pennsylvania district are not calling upon eastern makers as insistently as they have been, but some evidences of sales at sharp premiums continue to be seen. The sale of a small lot of re-rolling open-hearth billets for delivery in the Pittsburgh district at $30, eastern Pennsylvania mill, or $32.40, Pittsburgh, is noted. Forging billets continue to sell over the range of $34 to $40, mill, according to quality. One maker has closed several sales at the higher figure recently. A Cleveland buyer is still figuring upon 2,000 to 3,000 tons of tin bars for third quarter.

We quote delivered to consumers' plants in Philadelphia and vicinity: 4 x 4-inch open-hearth and Bessemer rolling billets at $30 to $31, and forging billets at from $36 to $40.

Sheets.—Several independent makers of sheets in the Pittsburgh district are more actively seeking business in the eastern Pennsylvania district and are offering quicker deliveries. Their price of 1.75c, Pittsburgh, or 1.90c, Philadelphia, for No. 10 gage blue annealed is considerably lower than the schedule of eastern Pennsylvania makers, which has been 1.90c, Pittsburgh, or 2.05c, Philadelphia, for this gage, and the latter may be averaged to lower than quotations. New business in sheets in the eastern market is not quite so active, but makers still have good tonnages upon their books.

We quote for delivery to consumers' plants in Philadelphia and vicinity: No. 10 gage annealed sheets at from 1.95c to 2.05c.

Old Material.—Prices in scrap materials, after a steady decline for some weeks, now seem to be more nearly stationary. Sentiment continues to show a slight improvement and consumers here and there are apparently watching conditions in the market more intently, but purchases by the leading buyers in the various grades are still meager. Heavy melting steel of first quality is quotable at from $13 to $13.50, delivered. A few small sales have been done at the minimum price. The purchase by a Schuylkill valley mill, which was the largest transaction recently noted, was done at $13.25, delivered, while dealers with higher-priced orders are still paying $13.50, delivered, at some points. A round sale of low phosphorus crop ends was made at $17.75, delivered eastern Pennsylvania. Low phosphorous plate shearings are bringing about $17.25, delivered.

We quote gross tons, delivered to consumers' plants in eastern Pennsylvania and western New Jersey, as follows:

Old iron rails (nominal)	$17.00 to 17.50
Old steel rails (rerolling)	15.50 to 16.00
No. 1 heavy melting steel	13.00 to 13.50
Old car wheels	15.00 to 15.50
Old iron axles (nominal)	26.00 to 27.00
Old steel axles	19.50 to 20.00
No. 1 railroad wrought	15.00 to 15.50
Wrought pipe	12.50 to 13.00
Cast borings	10.00 to 10.50
Machine shop turnings	10.25 to 10.75
Heavy cast (broken)	14.00 to 14.50
Malleable	13.00 to 13.50
Stove plate	10.50 to 11.00
No. 1 forge	12.00 to 12.50
Low phosphorus	17.25 to 17.75

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

ST. LOUIS

Scant Inquiry for Pig Iron

Office of THE IRON TRADE REVIEW,
St. Louis, March 4.

Pig Iron.—There are three inquiries in the St. Louis market for about 250 tons of high silicon iron, and scattering inquiries for 600 tons of northern and southern foundry. Sales last week were confined to car lots for immediate shipment. The foundries are all busy, however, and local sales agents are confident there will be some good business as soon as the large stocks of iron that were purchased several months ago are used up. Some re-sale southern iron has changed hands as low as $13, but local representatives of furnaces, as a rule, refuse to quote less than $13.50 to $13.75, f. o. b. Birmingham. Northern iron is held at $17.50 to $18, Chicago furnaces, and at $16.25 to $16.50, Ironton. Prices on southern iron, delivered, to which the freight of $3.75 from Birmingham has been added, follow:

Southern No. 1	$17.25 to 17.75
Southern No. 2	16.75 to 17.25
Southern No. 3	16.25 to 16.50
Southern No. 4	16.00 to 16.25

Coke.—Quite a little coke, perhaps a thousand tons, was sold last week in car-lot shipments, but the market is virtually bare of inquiry.

Old Material.—The Missouri Pacific Railroad Co. will close a list for 2,500 tons of scrap this week, and the Frisco one for 1,000 tons. The mills are running full force and want scrap, but the dealers are unwilling to let it go at prices offered by the melters The dealers are firmly of the impression that bedrock prices have been reached and that a turn for the better is not far off. This is particularly true of steel.

Gross Tons

Old car wheels	$14.50 to 15.00
Old iron rails	14.00 to 14.50
Rerol'g rails (5 ft. and over)	14.50 to 14.75
Old st'l rails (3 ft. and under)	13.50 to 14.00
Light section relayers (45 lbs. and under) subject to inspec.	23.50 to 24.50
Relay'g rails, subject to inspec.	23.50 to 24.50
Frogs, switches and guards	12.50 to 13.00
Heavy melting steel	12.50 to 13.00
Shoveling steel	10.50 to 11.00

Net Tons

No. 1 railroad wrought	$12.00 to 12.50
No. 2 railroad wrought	11.50 to 12.00
Arch bars and transoms	14.50 to 15.00
Knuckles, couplers, springs	10.50 to 11.00
Shafting	14.00 to 14.50
Iron car axles	21.50 to 22.00
Steel car axles	18.00 to 18.50
Locomotive tires	12.00 to 12.50
Pipe and flues	7.00 to 7.50
Tank iron and cut boilers	7.00 to 7.50
No. 1 cut busheling	10.00 to 10.50
No. 2 cut busheling	8.00 to 8.25
Cast and mixed borings	6.75 to 7.25
Machine shop turnings	8.00 to 8.25
R. R. malleable	11.00 to 11.50
Agricultural, malleable	9.50 to 10.00
Stove plates	8.50 to 8.75
Angle splice bars (iron)	13.00 to 13.50
Angle splice bars (steel)	12.00 to 12.25

NEW YORK

Bethlehem Steel Co. on Market for Ore Boats

Office of THE IRON TRADE REVIEW.
1115 West Street Bldg., March 4.

Iron Ore.—Sellers of Cuban merchant ore have little tonnage of either Bessemer or low phosphorus grades to offer for sale for the present year. Their sales to date, together with the large quantities being taken by the miners for their own operations, leave a little free tonnage. New buying of ores in the eastern market continues very quiet.

Pig Iron.—Inquiry for pig iron in this territory is slightly more active, but the market is still very narrow. A railroad equipment maker has distributed about 1,000 tons of foundry grades for various plants, some of it to southern makers, and is inquiring for additional lots. There is some movement in low phosphorus. One buyer, this district, took 1,000 tons and another 500 tons for second quarter. Lebanon low phosphorus continues $20 to $21, furnace. Prices remain soft. Lowest quotations on No. 2X yet developed has been $16, furnace, offered by central Pennsylvania maker. Michigan is slightly below $18, tidewater, and $18.45, New England. It is understood this price is being met on attractive lots in some directions. We quote:

Northern foundry, No. 1	$18.00 to 18.25
Northern No. 2X foundry	17.75 to 18.00
Northern No. 2 plain	17.50 to 17.75
No. 2 Virginia	18.05 to 18.30
No. 2 southern foundry	18.25 to 18.50
Malleable	18.50 to 18.75
Gray forge	16.50 to 16.75

Ferro-Alloys.—Small sales of domestic spiegeleisen have been closed in the market at close to $30.00, seaboard. Foreign material is quoted at several dollars higher. Ferro-manganese continues very quiet, but concessions on re-sale material below $65.00, seaboard, are less in evidence. One consumer is in the market for 150 tons for nearby shipment. Several carload inquiries for 50 per cent ferro-silicon are current. Prices on this alloy are well maintained.

We quote standard English 80 per cent ferro-manganese at $64 to $65, seaboard, for early and for first half shipment and $65 for second half; 50 per cent ferro-silicon on contract at $75, Pittsburgh or Philadelphia, for carloads, $74, for larger lots, and $73, for 600 tons or more.

Plates.—The Bethlehem Steel Co. has sent out tenders for 10 large ocean-going ore vessels, which are to be used in transporting ore from the Chilean holdings recently acquired by the company, to Philadelphia, by way of the Panama canal. These vessels will call for a very large tonnage of steel. It has been reported that these boats would be built abroad, but it is officially stated that no orders have yet been placed on these inquiries. A number of cars remain under negotiation, but awards are now coming more slowly. The Baltimore & Ohio railroad, because of recent legal obstacles that have interfered with its proposed issue of bonds, has withheld action on its inquiry for 1,000 hoppers and 500 refrigerators. It has closed upon its locomotive order, however. The Boston & Maine inquiry is still open. Eastern plate mills report a considerable increase in new business during the past week after several weeks of lighter demand, in which deliveries were somewhat shortened. Shipment periods are again being extended to four and six weeks. Some second quarter contracting in plates is being done by eastern makers at 1.60c, Pittsburgh, which remains their minimum price. Premium business is of less volume.

We quote, delivered at New York tidewater, for first quarter, 1.76c to 1.81c, New York, on sheared plates. Some makers are asking $1 higher for universal plates. On third quarter and last half contracts, Pittsburgh district, makers are quoting 1.61c to 1.66c, New York. Plates from store 2.15c.

Structural Shapes.—Eastern shape mills continue to book a liberal tonnage of quick shipment orders from western consumers who apparently are badly in need of material because of the filled-up condition of the nearby mills. On this business, eastern makers are readily obtaining 1.60c, mill, for stock lengths of material. For eastern delivery, the eastern Pennsylvania mills continue to quote shapes over a range of 1.50c to 1.60c, Pittsburgh, or 1.66c to 1.76c, New York. They usually will not take contracts beyond second quarter. Competition among some fabricating interests in this district is still very keen and low prices for erected work continue to come out. In some cases, these are reported below $55, erected, on attractive tonnages.

Lettings are light, but there is considerable work in contemplation. The Passaic Structural Steel Co. has 800 tons for the Paine Furniture Co. building, Boston, for which Bethlehem sections are specified; the Berlin Construction Co., 225 tons for an addition to the Hotel Garde, New Haven, Conn., and the Guerber Engineering Co., 130 tons for a blacksmith shop for the Central of New Jersey railroad at Communipaw, Jersey City. The Hay Foundry & Iron Works is reported to have an apartment at 107th street and Broadway, about 1,000 tons. The American Bridge Co. is low on the Central of New Jersey bridge at Catasauqua, Pa., which, depending upon the number of tracks to be adopted, will require from 400 to 800 tons. Post & McCord have submitted the lowest price on the steel work for the Lord & Taylor uptown store, 8,000 tons, which indicates that the fabrication work will go to the American Bridge Co., but no award has yet been made, as the tenders have exceeded the appropriation. It is expected that this award will be settled in a few days, however.

The Pennsylvania Steel Co. has nine small bridges from the Boston & Maine, which recently took bids on about 1,000 tons of bridge work. The Lehigh Valley railroad is inquiring for 500 tons of bridge work and the New York Central is in the market for a Scherzer lift bridge near Peekskill, N. Y., requiring a small tonnage. The pier shed for the New York Central railroad, at Weehawken, N. J., will require 500 tons. Bids have been asked for a loft on Twenty-fifth street for the New York & Chicago Realty Co., 600 tons; for a loft at Canal and Lispenard streets, for the Manhattan Realty Co., 600 tons; for an office building and loft for the Fabian Construction Co., East Twenty-eighth street, 700 tons, and for the municipal building, Hartford, Conn., 400 tons, upon which P. J. Carlin has the general contract. The 2,000 tons of steel for the Toronto high school has not yet been placed. Bids are going in this week on an apartment house in Jersey City, N. J. A hotel in Newark, N. J., will soon be up for figures.

We quote for New York delivery for first quarter as follows: Structural shapes, 1.66c to 1.76c. On third quarter and last

half contracts, Pittsburgh district makers are quoting 1.61c to 1.66c New York.

Structural shapes from store, 2.15c.

Rails and Track Material.—The Baltimore & Ohio railroad has distributed orders for 15,000 kegs of standard spikes. Current quotations on standard spikes range from 1.85c to 1.90c, Pittsburgh, and on small spikes from 1.95c to 2c, Pittsburgh. Considerable activity continues in the girder rail market. The Lorain Steel Co. recently took an order for 7,500 tons for the Buffalo street railways and has also received 1,500 tons for the Third Avenue Railway Co., New York City. The Pennsylvania Steel Co. has received 850 tons of girder rails for Rochester, and there remain about 700 tons of girder and tee rails yet to be placed for that city. The large girder rail order for the Chicago City Railways Co. is expected to go to the Lorain Steel Co.

BUFFALO

Melters Continue to Hold Off

Office of THE IRON TRADE REVIEW,
Buffalo, March 4.

Pig Iron.—The sales for the week totaled about 15,000 tons. The reports indicate that this was made up of several orders for special grades and a number of carload and small orders for foundry, malleable and basic. The inactivity of the buyers is still apparent to a marked degree. Even in the face of needing iron for nearby consumption, consumers still continue to hold off. On the other hand, the furnaces of this district are being pressed for deliveries on iron under contract and shipments continue to be very heavy. One interest, during the month of February, shipped fully 52,000 tons on contracts to customers over a wide range of territory. While some of the sales made during the week were upon a special basis, there was not a sufficient variation or volume placed to alter the schedule quoted last week. The range for the week, f. o. b. Buffalo, is substantially as follows, the only change being a widening of the range on basic:

No. 1 foundry	$17.00 to 17.50
No. 2X foundry	17.00 to 17.25
No. 2 plain	16.75 to 17.25
No. 3 foundry	16.50 to 17.00
Gray forge	16.25 to 16.75
Malleable	17.25 to 17.75
Basic	17.00 to 18.00
*Charcoal	18.00 to 19.00
*Some grades	21.75

Finished Material.—A considerable increase in the demand for structural material was noticeable during the week. Users of practically all lines came into the market with inquiries. The consumers have come to realize that in order to be sure of their requirements it is not only necessary to place orders where possible, but to also specify far in advance, so as to gain the advantage of being included in the rolling schedules of the mills. All the offers so far made have been at prevailing prices. It is decidedly a sellers' market, as the consumers are seeking consideration of the requirements from the producers. Specifying for fourth quarter needs is an ordinary occurrence now. The mill sheets were advanced 10 cents per 100 pounds during the week. In structural material, there are now a number of projects under way which will shortly require a considerable aggregate tonnage, although none of the individual operations are very extensive.

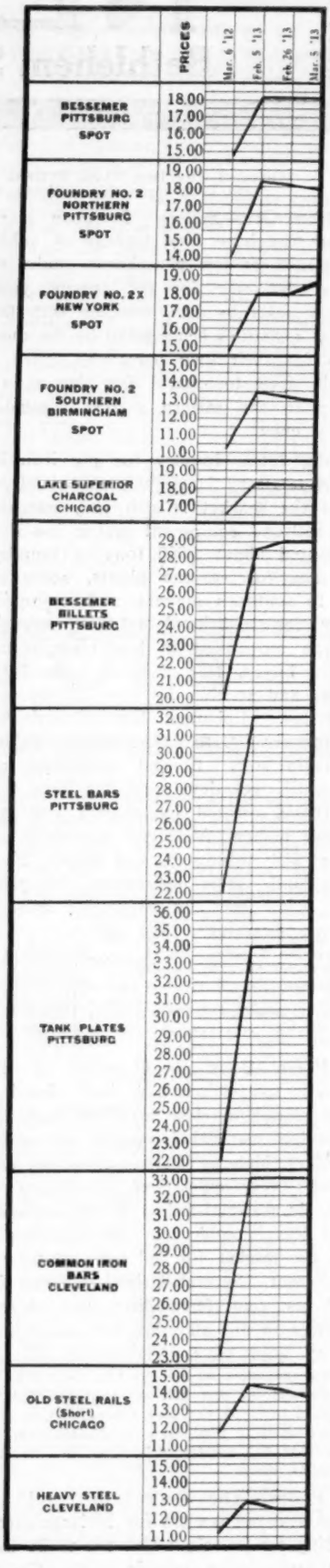
Bids are to be taken in a short time for a four-story cold storage plant at Batavia, N. Y., to be 75 x 200 feet, owner C. H. Teicher, requiring a fair tonnage. Robert North, Buffalo, architect.

The state engineer's office will open bids, March 18, for two barge canal bridges, on contract 65, requiring 475 tons. The Buffalo Structural Steel Co., Buffalo, is low bidder on the steel for the new Hutchinson high school, requiring about 1,400 tons.

Old Material.—The only activity in the market during the week was in heavy melting steel and old car wheels, but not of sufficient volume to vary prices from the schedule given last week. The other lines showed hardly a trace of movement. There seems to be a disposition on the part of dealers to disregard the absence of buying and not to soften schedules for the purpose of inducing sales. They are of the opinion that an improvement in the situation will shortly develop and that the trend of prices will be upward rather than downward. The range for the week, for gross tons, f. o. b. Buffalo, is substantially as follows:

Heavy melting steel	$14.00 to 14.50
No. 1 R. R. wrought scrap	14.00 to 14.50
No. 1 R. R. and mch. cast scrap	13.75 to 14.25
Old steel axles	17.00 to 17.50
Car wheels	15.75 to 16.25
Railroad malleable scrap	13.25 to 13.75
Wr'ght iron and soft steel turn.	8.25 to 8.50
Cast iron borings	7.50 to 8.00
Low phos. steel scrap	17.00 to 17.50
Old iron rails	15.00 to 15.50
Boiler plate, sheared	15.50 to 16.00
Stove plate (net ton)	9.75 to 10.00
Locomotive grate bars	11.00 to 11.50
No. 1 busheling scrap	12.00 to 12.50
No. 2 busheling scrap	10.00 to 10.50

PRICE CHART



BIRMINGHAM

Interest Centers in Furnace Stocks

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., March 4.

Pig Iron.—At the present moment, local producers are principally interested in the condition of furnace stocks as shown by February returns now being compiled. It is quite probable that the aggregate tonnage on hand has increased materially, or to figures considerably above 100,000 tons; but the increase is accounted for by the heavier rate of production during February, rather than by smaller shipments. With a total of 24 stacks in blast all through the month, the daily output was some 10,000 tons, and while the melt was larger than normal, it was not expected to take care of the production. Some changes are to be made in the furnace operations prior to April 1, but the extent to which the output will be affected cannot be said just at this time. Of the stacks now in blast, eight are producing basic, leaving 16 of the largest and best equipped plants in the district on foundry grades. The matter of prices, either for spot delivery, or for shipment in the next few months, is still an uncertainty. A very wide range is noted in all quotations, and the considerations for the tonnage being sold are definitely known in but few cases. The aggregate of all sales made in the past week is small, with the prices reported ranging from a basis of $13.25 to $14, at Birmingham, for No. 2 foundry. The transactions referred to are reported by the furnace interests, with little information obtainable relative to re-sale considerations. Reports of the offering of this last in different sections of the trade at figures around $13, at Birmingham, are frequently received, and some tonnage is no doubt being sold at such figures; but the extent to which the market is affected is not known, owing to the lack of demand, and the absence of interest generally.

The largest sale reported in the week involved 100 tons of No. 2 foundry, for prompt delivery. Aside from this, carloads were the considerations, with few inquiries for larger requirements. For delivery in the remainder of the first half, and into the third quarter, more or less tonnage is pending in indefinite form; but the prospects for the immediate future are not encouraging. In the meantime, old contracts are being completed at a rate generally satisfactory to the producing interests, and gin the work of re-organization, being cleaned up. With the exact status of prices undetermined, deliveries in the remainder of the first half are quoted nominally as below, per gross ton, f. o. b. cars Birmingham furnaces, viz.:

No. 1 foundry	$13.50 to 14.50
No. 2 foundry	13.00 to 14.00
No. 3 foundry	13.00 to 13.50
No. 4 foundry	12.50 to 13.00
Gray forge	12.00 to 12.50
Mottled	11.50 to 12.00
Standard basic	14.00 to 14.50
Off basic	11.00 to 11.50
Charcoal	25.00 to 25.60

The recent improvement in the demand for basic has, of course, affected the local situation to some extent; however, the local make is being consumed at the producers' operations, and the tonnage for sale has not increased.

Old Material. — As a result of shading for certain grades, the market was more active in the past week than in the week previous. Steel scrap was principally in demand since the last report, with re-laying rails, and old car wheels required in considerable quan- stronger. Light cast and stove plate are very weak, in line with the condition of the pig iron market, with little demand for country grades. Present asking prices at dealers' yards are about as follows, per gross ton, viz.:

Old iron axles (light)	$15.50 to 16.00
Old steel axles (light)	15.50 to 16.00
Old iron rails	14.00 to 14.50
No. 1 R. R. wrought	12.50 to 13.50
No. 2 R. R. wrought	10.50 to 11.50
No. 1 country wrought	10.00 to 10.50
No. 2 country wrought	9.00 to 9.50
No. 1 machinery cast	10.50 to 11.00
No. 1 steel scrap	11.00 to 11.50
Tram car wheels	11.00 to 11.50
Standard car wheels	12.50 to 13.00
Light cast and stove plates	9.00 to 9.50

METAL MARKETS

Chicago

March 3.

New Metals.—New metals are very weak in this market, further declines being apparent in copper. Spelter is slightly weaker.

We quote dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 14⅞c; casting, 14½c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 6.05c; lead, desilverized, 4.25c; sheet zinc, 8.25c, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 47.47c; Cookson's antimony, 9⅜c; other grades, 8⅜c.

Old Metals.—Continued sympathy with the new metal market has caused further weakness in old metals, buying still being confined to immediate needs.

NEW OHIO RIVER BRIDGE

Will Require 13,000 Tons of Steel—Work Begins Soon.

Official announcement has been made by W. J. Mills, president and general manager of the Paducah & Illinois Bridge Co., and superintendent of the Paducah-Memphis division of the Nashville, Chattanooga & St. Louis railroad, of the construction of a bridge across the Ohio river at Metropolis, Ill., 12 miles below Paducah, Ky., work to begin within a few weeks. This bridge, which will probably require two or three years to construct, will be a double track structure, consisting of eight spans from 250 to 700 feet each, connecting with 2,000 linear feet of steel viaduct, which will require approximately 13,000 tons of steel; and 80,000 cubic yards of concrete masonry, requiring approximately 500,000 pounds of reinforcing bars. The bridge, with steel approaches, will cost approximately $3,000,000, while the earth approaches and line to Paducah with approaches is estimated to cost $2,000,000. The Paducah & Illinois Bridge Co. was organized to construct this bridge by several roads interested, including the Illinois Central, The Nashville, Chattanooga & St. Louis, the L. & N., the C., B. & Q. and C. & E. I. The construction of this bridge is considered necessary on account of the increased amount of traffic expected soon through the opening of the Panama canal.

Allis-Chalmers Property Sold

The personal property of the Allis-Chalmers Co., of Milwaukee, was bid in at $4,000,000 by Fred Vogel Jr., president of the First National Bank of Milwaukee, representing the re-organization committee, at the sale conducted by Gen. Otto H. Falk, receiver, on Feb. 27. Just before the bids were called for, there was interposed notice of objection on the part of the preferred stockholders of the Bullock Electrical Mfg. Co. of Cincinnati, a subsidiary of Allis-Chalmers, who denied the claims of the company, holding that their accounts more than counterbalanced. The real estate and other properties of the Allis-Chalmers company were sold at auction on Feb. 3, the purchaser in this case also being the re-organization committee. The next step will be to have the two sales confirmed by the federal court, following which the receiver will formally be discharged, and the committee will begin the work of re-organization.

FIVE MILLIONS

Will be Spent by Cambria Steel Co. For Improvements.

William H. Donner, president of the Cambria Steel Co. and Effingham B. Morris, chairman of the executive committee, in the annual report for 1912, recommend the expenditure of $5,000,000 to carry out the general policy of the Cambria company along the lines of additions, improvements and extensions. Their report indicates that the total output of the company for 1912 was about 34 per cent greater than the previous record.

Net earnings of the company in 1912 were $3,901,351 as against $3,248,746 for 1911, and $4,946,806 for 1910, by far the best year of the company indicated in the annual report. Small earnings are largely accounted for by the low price at which products of the company were sold, according to the general statement. At the end of the year, considerable tonnage taken on low-priced contracts still remained on the books. Prospects for the year 1913 are much brighter than those of a year ago, and the report indicates that the Cambria Steel Co. is in a sound financial condition.

The income from the operation of the several properties, after deducting other expenses incident to the same (including those for original repairs and maintenances, approximately $2,550,000 currently charged during the year to cost of production) amounted to $4,301,380.80, to which is added the income from rentals, investments, interests etc., $145,328.54, which gives the gross earnings at $4,446,709.34.

From the gross earnings is deducted provision for extraordinary replacement and for exhaustion of the minerals, amounting to $545,358.03, which gives to net earnings $3,901,351.31, from which are deducted the fixed charges under the Cambria Iron Co. lease and interest of term notes, amounting to $490,268.30, giving a net income of $3,411,083.01.

Dividends of 1¼ per cent, declared May 15, Aug. 15, Nov. 15, 1912, and Feb. 15, 1913, aggregate $2,250,000, giving a surplus net income at the end of the year of $1,161,083.01, which is the balance carried to profit and loss. The profit and loss, Dec. 31, 1911 $2,784,103.82, gives the total profit and loss, Dec. 31, 1912, $3,945,186.83.

The report says: "The curtailment in demand for your products which existed in 1911, continued during January and February, 1912, but a decided revival in business occurred in March, which has continued, the demand for all lines being greater than your capacity. During the first half of the year, many orders were booked for future delivery at low prices, and in some lines in excess of your capacity for the entire year. * * * The improvements in sight will call for expenditures of approximately $5,000,000. The present serious shortage in labor will make it exceedingly difficult and perhaps impossible to complete these improvements promptly."

The principal appropriations and expenditures during the year for plant additions aggregated $866,481.69. Extensions and additions were given in full in the Jan. 2 issue of THE IRON TRADE REVIEW.

PAY TRIBUTE

American Iron and Steel Institute Directors Honor Swank.

At a meeting of the directors of the American Iron and Steel Institute, held on Feb. 28, resolutions expressing the profound appreciation of the directors of the fidelity and skill by which James M. Swank discharged the duties of his office as secretary and general manager of the American Iron and Steel Association for many years, were adopted. The directors also paid a tribute to Mr. Swank as a man.

Isaac M. Scott, of Steubenville, has resigned from the board of directors of the institute because he found it impossible to attend the board meetings as regularly as he desired. President William H. Donner, of the Cambria Steel Co., was elected a director to succeed Mr. Scott.

The following new members have been elected:

Lawrence L. Arnold, general manager, Wickwire Steel Co., Buffalo.
Walter A. Barrows Jr., metallurgist, Brainerd, Minn.
J. Orr Callaghan, Steel Co. of Canada, Hamilton, Ont.
William H. Cameron, manager safety department, American Steel Foundries, Chicago.
Charles L. Cantley, assistant to general manager, Nova Scotia Steel & Coal Co., New Glasgow, Nova Scotia.
William L. Davis, manager Old Meadow Works, American Sheet & Tin Plate Co., Scottdale, Pa.
Ralph B. Dimmick, chemical engineer and metallurgist, American Rolling Mill Co., Middletown, O.
Daniel Eppelsheimer Jr., mechanical engineer, American Rolling Mill Co., Middletown, Ohio.
Robt. H. Irons, general superintendent, Central Iron & Steel Co., Harrisburg, Pa.
Ross H. McMaster, Steel Co. of Canada, Montreal, Canada.
Marvin A. Neeland, assistant to vice president, United States Steel Corporation, New York City.
Frank Samuel, Howe & Samuel, Philadelphia.
Wm. O'Neill Sherman, chief surgeon, Carnegie Steel Co., Pittsburgh.
Arthur J. Skemp, manager Scottdale Works, American Sheet & Tin Plate Co., Scottdale, Pa.
Wm. P. Snyder Jr., assistant to president, Shenango Furnace Co., Pittsburgh.
Frank H. Whitton, Steel Co. of Canada, Hamilton, Ont.
W. A. Wickwire, secretary, Wickwire Steel Co., Buffalo.
Herbert M. Wilson, secretary, Shenango Furnace Co., Pittsburgh.

BIG PROJECT

Approved by Commission—Will Require Very Large Tonnage.

New York, March 5. (By wire.)—The approval of the plans for the new Tri-borough Rapid Transit system by the public service commission brings the preliminaries of this great project to their final stage. Upon the signing of the operating contracts by the board of estimate within a few days, bids will be asked for the construction work, which means the release of total steel requirements estimated at 350,000 to 400,000 tons. The total outlay for work yet to be let involves about $300,000,000. The American Bridge Co. has been getting the great bulk of the tonnage for subway work so far let.

OBITUARIES

Fred W. Hubbard, aged 50, secretary of the Kilbourne & Jacobs Mfg. Co., and president of the Sun Mfg. Co., both of Columbus, O., died March 2 at his home in that city.

George B. Lamb, vice president and general manager of the Waterbury-Farrel Foundry & Machine Co., died recently at Waterbury, Conn. He had been connected with the company since 1871.

Clement Augustus Davison, Detroit, one of the founders of the Michigan Malleable Iron Co., died unexpectedly at Tucson, Ariz., last week, of uraemic poisoning.

Sir William Henry White, the originator of the modern dreadnought, died suddenly in London, England, Feb. 27, from an attack of apoplexy, at the age of 68. He was in the constructive department of the admiralty from 1867 to 1883, and rose to the rank of chief constructor.

J. Hervey Sternbergh, who had been actively identified with the iron industry and was one of the leading citizens of Reading, Pa., died in that city, March 3, at the age of 79 years. Forty-five years ago, he established at Reading a small plant which grew into the Reading Bolt & Nut Works, a large industry employing many hundred men. This plant, with a half dozen others, principally located at Lebanon, was later merged into the present American Iron & Steel Mfg. Co., of Lebanon. Mr. Sternbergh served as president of the combination for about six years, when he retired.

Reducing Spring Manufacture to a Science

Equipment of a Modern Testing Laboratory to Facilitate the Scientific Manufacture of Motor Vehicle Springs

Among the many problems involved in the development of the automobile was the manufacture of springs which would combine the maximum of strength with the minimum of weight to withstand the severe service to which they are subjected in motor car operation. In the last decade, spring manufacturing methods have undergone revolutionary changes to meet these new requirements, and alloys and special steels to a large extent have replaced the standard grades formerly used. This practice has passed through various stages of refinement, until at present, practically every operation is on a scientific basis.

When the Perfection Spring Co., Cleveland, was compelled to erect a new plant to meet the growing demands for its product, it decided that the methods to be pursued in these works should represent the latest and best practice, and to eliminate guesswork and rule-of-thumb methods entirely, a chemical and physical testing laboratory was provided.

The building in which this department is located is a two-story, brick structure, 22 x 40 feet. Plan views of both floors are shown in Figs. 4 and 5.

The lower floor, which is devoted to physical or approximate tests, is divided into two rooms, the experimental hardening and tempering furnaces and the electric muffle and crucible furnaces being located in one, while the other affords space for three Olsen physical testing machines. The second floor is devoted to the chemical laboratory and to the office of Prof. Z. B. Leonard, who is in charge. The interior of the chemical laboratory is finished in white, porcelain-faced brick, which gives it an attractive and cleanly appearance.

Guaranteed Springs

In building and equipping this testing laboratory, the management had in mind ultimately reducing the commercial spring business to a basis of exact calculation in buying, manufacturing and selling. The offices of this company claim that within two years, they expect to sell motor vehicle springs, not alone by the pound, but also on a basis of guaranteed ultimate strength. In other words, a purchaser having bought springs guaranteed to develop an elastic limit of 200,000 pounds shall have the privilege of returning any broken springs to the laboratory, and if the parts within 2 inches of the point of rupture, upon being tested, fail to develop the guaranteed strength, the springs will be replaced free of charge. On the other hand, if it appears that there is no defect in the material, and if the tests show that the spring is up to the guarantee, there can be no question but that the breakage was due to abuse or erroneous specifications on the part of the purchaser.

The New Plant

The new plant, of which this laboratory is a part, has a capacity of 450 tons of finished springs per month and embraces a floor area of 100,000 square feet. The old plant, which is still in operation, has 35,000 square feet of floor space and a capacity of approximately 200 tons per month. This original plant is now devoted to the manufacture of springs, all of which go to one automobile builder and are used for pleasure cars only. This, in a measure, suggests the extent of the motor vehicle spring business of the United States.

The new laboratory, in itself extensive, is only one of the tools with which Christian Girl, the president, hopes to accomplish a revolution in spring manufacture, whereby hand work and individual judgment will be eliminated and all processes which are not strictly automatic will be under the control of a responsible shop foreman or office executive. In this connection, it may be noted that spring makers in the past have not availed themselves of applied scientific knowledge to anything like the extent which they might have done and have been repaid a great many times over in both a better product and a lower cost.

In the general equipment of the laboratory, only apparatus and machines which are recognized as standard, have been purchased. The chemical laboratory includes apparatus for the distillation of water, a Johnson apparatus for the determination of carbon in iron, the ordinary equipment for determining carbon by color tests and other similar accessories as are necessary in making chemical analyses. In addition, Prof. Leonard has secured from the Bureau of Standards, guaranteed samples to be used as a check on all analyses.

The Johnson apparatus consists of an oxygen tank, a small electric furnace and numerous other adjuncts. In

FIG. 1—PHYSICAL TESTING LABORATORY—THE OLSEN TESTING MACHINE IS AT THE RIGHT, AND THE COLD BENDING MACHINE IS AT THE LEFT

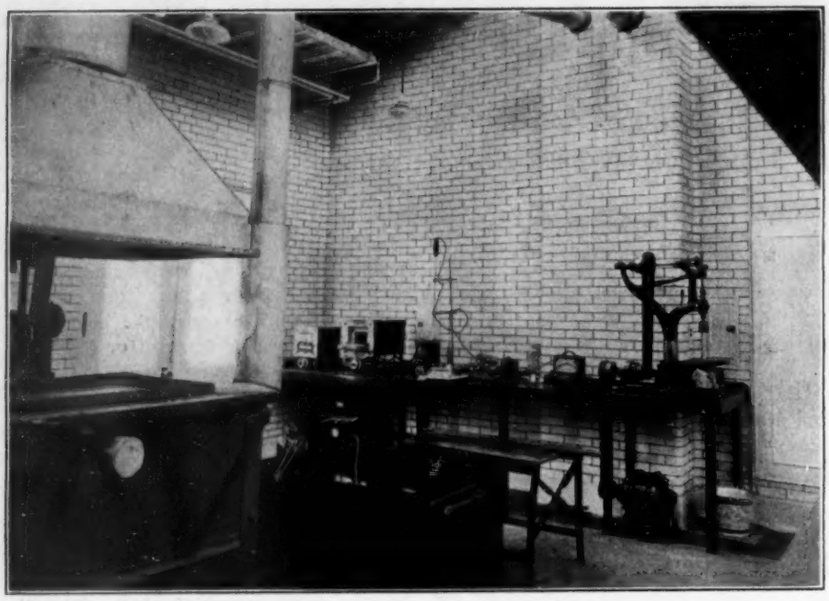


FIG. 2—FURNACES IN THE HEAT TREATMENT LABORATORY

operation, the oxygen travels from the tank through a connecting tube to several vials of chemical salts. In the passage through these, the oxygen is dried and any grease which may have been absorbed during its manufacture is removed. Just before entering the furnace, the oxygen passes through a mercury valve, the purpose of which is to prevent the return of the gas to the tank. The sample of metal to be tested is placed in a clay boat and is introduced into the furnace, where it is subjected to the heat of an electric resistance coil in the presence of oxygen. From this furnace, the gases are lead through cleansing chemicals, which are calculated to remove everything except carbon dioxide. From the cleansing process the carbon dioxide gas passes into a weighing flask, the weight of the contents of which has been determined previously. The increase in the weight of the flask, coupled with a knowledge of the atomic weights of carbon dioxide, makes the calculation of the carbon content of the sample analyzed, merely an arithmetical computation. That this apparatus is or is not working properly is determined by testing with the standardized samples obtained from the government. As a further check, the carbon content also is determined by the ordinary color method.

Microphotographic Equipment

A Leitz microscope with photographic attachment has been imported from Germany. This equipment is located in the office, while the materials and apparatus for the preparation of specimens for microphotography are in the polishing and etching room at the rear.

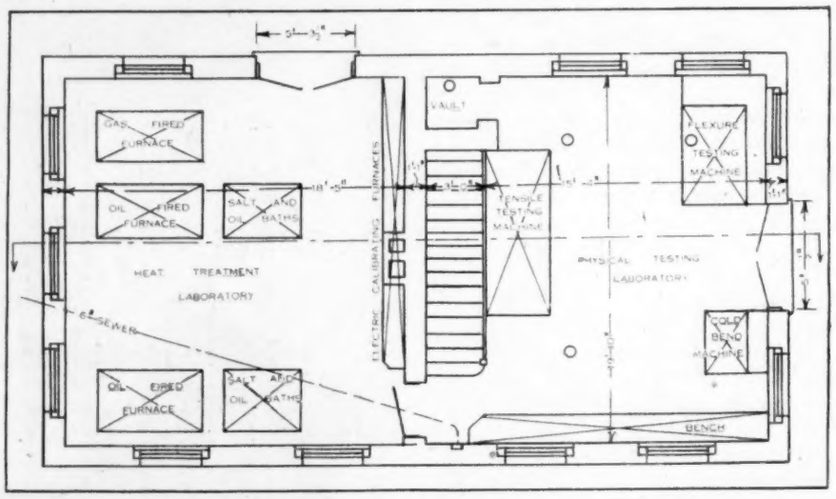


FIG. 4—FIRST FLOOR PLAN OF TESTING LABORATORY

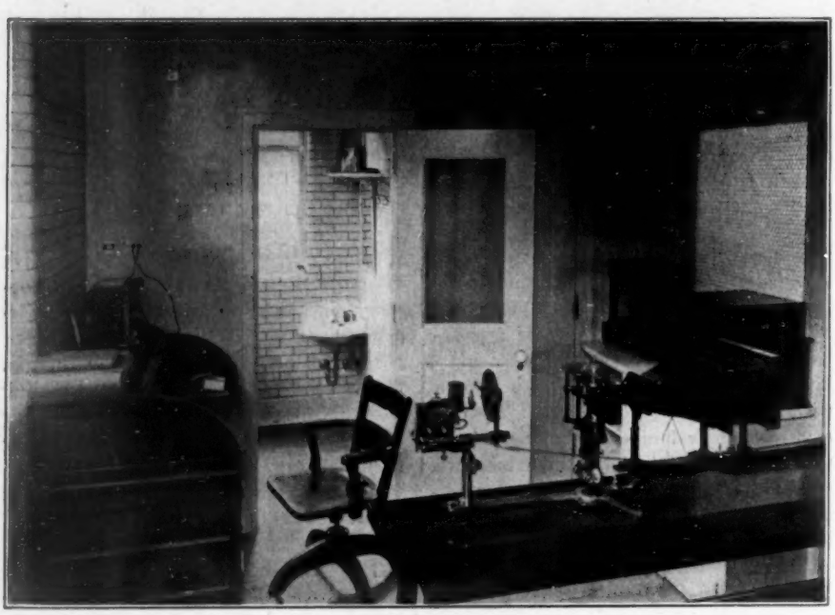


FIG. 3—OFFICE AND MICROPHOTOGRAPHIC ROOM

The equipment of this room consists of the ordinary polishing materials, such as emery flour, tripoli powder and rouge, with an electrically-driven device having a rotating disc on which the specimens are polished, the disc having been coated with the proper abrasive. The ordinary sequence of these operations is first grinding with emery dust, next tripoli powder and lastly finishing with rouge. After this burnishing, the specimen has a mirror-like surface, on which no distinguishing characteristics can be observed. In order to complete the preparation of the specimen for examination or photographing, it is subjected to the action of different acids, each serving to bring out some particular characteristic or element. The microscope of the microphotographic apparatus has the power of enlargement to 1,000 diameters, although the specimens are usually photographed at from 80 to 150 diameters.

The heat-treating and tempering laboratory, located on the ground floor, is equipped with one gas-fired furnace for hardening and two oil-fired furnaces for tempering. The hardening furnace, which was built by the American Gas Furnace Co., Elizabeth, N. J., is equipped with an interesting, though somewhat complicated, heat regulator. This device consists of a graduated dial over which two hands move, one controlling the electrical device, which in turn subjects the gas valve diaphragm to compressed air, while the other is manually-controlled by the operator. A small thumb screw at the side allows the operator to set the controlling hand at the temperature desired and the moving hand, as previously stated, indirectly opens or closes the gas valve, thereby automatically reducing or increasing the amount of gas entering the furnace until the temperature, as indicated by the manually-controlled hand, is reached.

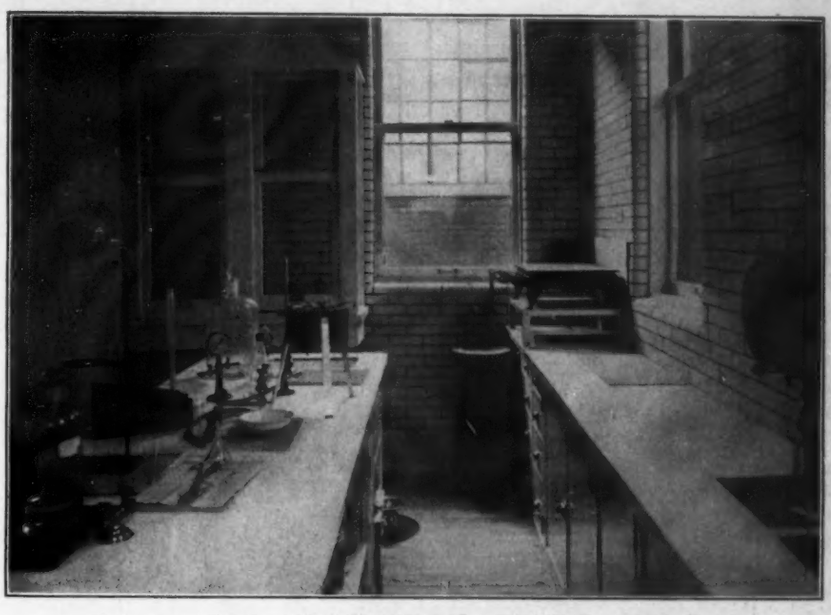


FIG. 6—GENERAL ARRANGEMENT OF CHEMICAL LABORATORY

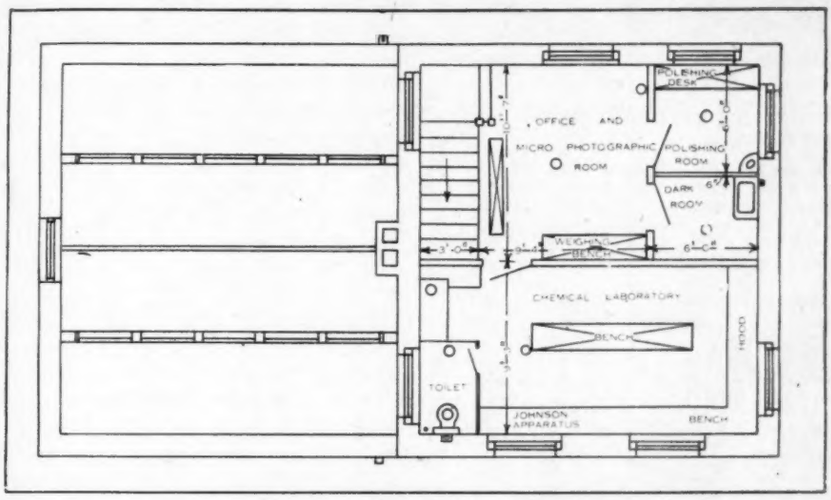


FIG. 5—SECOND FLOOR PLAN OF LABORATORY

The oil-fired furnace has the common type of burner, in which the fuel is atomized by the action of compressed air, this compressed air being piped from the plant. This furnace is used for heating the salt bath, in which the steels are experimentally tempered. This is an experimental outfit for perfecting better methods and the work done by it has no connection with the ordinary factory process. A salt bath is used for heating and drawing the steel as the high specific heat of the salt facilitates the maintenance of a fixed temperature, and the immersion of the steel in the liquid protects the heated metal from the attack of atmospheric and fuel gases. Potassium chloride and barium chloride are the salts most commonly employed for this purpose.

Electric muffle furnaces for determining the decalescent and recalescent points of sample steels, and a crucible furnace for use in recalibrating pyrometers, have been included in the equipment of this heat treatment laboratory. In the calibration of a pyrometer, some common metal, the fusion point of which is definitely known, is melted in the crucible furnace, and its temperature is taken by the pyrometer. By this method accurate rectification of the calibration of the thermo-couple may be obtained as often as needed.

Physical Testing Equipment

In the physical testing room, which also is located on the lower floor, three machines, manufactured by Tinius Olsen & Co., Philadelphia, have been installed. One of these has a capacity of 100,000 pounds and is used for determining tensile strengths, moduli of elasticity, reduction of area and ultimate strength. This machine is equipped with an auto-

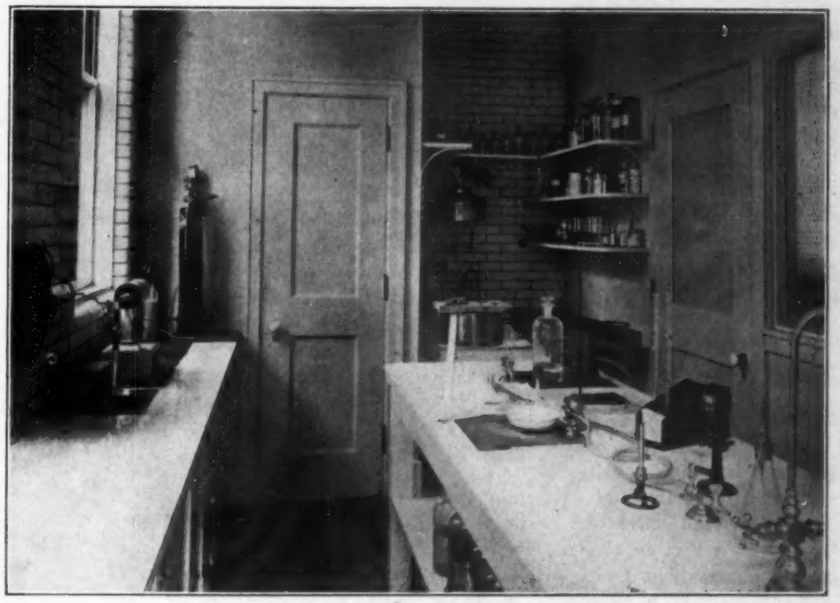


FIG. 7—END VIEW OF CHEMICAL LABORATORY, SHOWING JOHNSON APPARATUS AND WATER STILL

matic recording dial, which furnishes the operator with a continuous diagram of the entire experiment.

The cold bend testing machine is for the purpose of determining the flexibility of the steel springs after completion. This machine consists of a circular, stationary bed plate, inside of which a disc revolves, carrying with it the spring to be tested, the arrangement being such that the spring is caught against a fixed block on the stationary table and is bent until failure occurs or until it is doubled upon itself about a radius of approximately 1 inch. During this test a record can be obtained of the degree of bending before permanent set, and the physical character of the metal at the point of fracture.

Vibrating Machine

The third machine, which completes the equipment of this portion of the laboratory, is a vibrating machine, in which a completed spring is placed and tested to failure. This machine has a movable table, on which the outer ends of the inverted spring rest. The table moves upward and downward, bringing the spring in contact with a block on the standard of the machine in such a way as to flex the spring, much the same as would occur in ordinary service. It is stated that springs of good material will stand from 900,000 to 1,000,000 flexures without rupture, which is equivalent to two years' service.

Steel Used

While the fully-equipped laboratory is something of a novelty among spring manufacturers, it is hoped that this laboratory will save the expense of operating it by economies effected in the purchase of material. It has been difficult, without a laboratory, to know definitely that materials purchased under a chemical specification were exactly as represented. The steels used in this plant are bought under specifications given in the accompanying table.

This company has already experimented in the use of chrome, silico-manganese, chrome-vanadium and chrome-nickel-tungsten steels, although for the greater part of the commercial work it is using silico-manganese steel. Some difficulty was experienced with the nickel alloys, both in respect to the small allowable range of temperature for hardening and also in respect to a decided tendency toward warping in cooling.

Further studies of other alloys will be undertaken and a mass of data will be collected which will yield definite knowledge of the physical effects of the different chemical constituents of steels, making it safe to use grades and alloys not formerly well-known. As a result, great economies will be effected in purchasing, contemporaneous with the production of even better motor vehicle springs than those which have been made in the past.

PURCHASE SPECIFICATIONS FOR STEEL FOR THE MANUFACTURE OF MOTOR VEHICLE SPRINGS.

Kind of steel.	Crucible.	Krupp silico-manganese.[1]	Cambria.	Electric silico-manganese.	Electric vanadium.
Elastic limit	148,000	210,000	130,000	206,400	210,100
Width of test bar, inches	1¼	2¼	1¼	2	2
Thickness of test bar, inch	0.270	0.255	0.270	2.67	0.272
Distance bet. supports, inches	18	18	18	18	18
Specified deflection, inches	1.7	2.2	1.4	2½	2¼
Load to be carried without permanent set, pounds	1,100	1,500	1,000	1,700	1,800
Brinell hardness	302	.....	302	340	321
Combustion carbon, per cent.	0.805	.....	1.00	.....	.....
Carbon, per cent	.....	0.60 to 0.68	.....	0.50	0.45
Phosphorus, per cent	0.012	not ov. 0.05	0.045	0.015	0.025
Manganese, per cent	0.34	not ov. 0.60	0.56	0.83	0.70
Sulphur, per cent	0.027	not ov. 0.03	0.05	0.025	0.03
Silicon, per cent	0.16	1.30 to 1.60	0.014	0.41	0.22
Chromium, per cent	.....	.....	.....	0.77	1.25
Vanadium, per cent	.....	.....	.....	.....	0.24

[1]This is the same steel used for taking the recoil on guns.

The Standard Machinery Co.'s Power Press

On page 522 of the Feb. 27, 1913, issue of THE IRON TRADE REVIEW was published a description of a new power press, but the name of the builder, the Standard Machinery Co., Providence, R. I., was not mentioned. The machine is designed for use where a quick blow is required in blanking, swaging or forming.

Austria-Hungary is the fourth largest coal producing country in the world, although three states of the United States are much larger producers. In 1910, Austria-Hungary mined 53,600,000 tons of coal, which was less than one-fourth of Pennsylvania's production for 1911, whereas West Virginia produced nearly 60,000,000 and Illinois 53,683,000 tons.

Foundrymen's Convention

Chicago foundrymen already are perfecting their arrangements for the entertainment of the visitors who will attend the convention of allied foundrymen's associations, which will be held Oct. 10 to 17. To interest casting manufacturers in Chicago and vicinity, a mass meeting will be held at the Lasalle hotel about March 12, at which time a permanent committee on convention arrangements with a chairman, treasurer and secretary will be appointed. This committe will represent the foundrymen of Chicago and will work in conjunction with the Chicago Association of Commerce in handling all the local work in connection with the convention.

To prepare for the mass meeting, a luncheon will be held at the Lasalle hotel on March 6 by the preliminary committee on convention arrangements appointed by the Chicago Foundrymen's Club and the Chicago Association of Commerce. The latter will be represented by G. M. Spangler. The committee representing the Chicago Foundrymen's Club includes J. A. Gallagin, of Pickands, Brown & Co.; E. F. Axner, of the Illinois Steel Co.; James Wood, of the Sheffield Foundry Co.; C. E. Hoyt, of the Foundry & Machine Exhibition Co.; S. T. Johnson, of S. Obermayer Co.; C. B. Carter, and H. Cole Estep, of THE IRON TRADE REVIEW, chairman.

Metal Statistics

The 1913 edition of *Metal Statistics,* issued by the American Metal Market Co., New York City, contains 255 pages, principally devoted to a record of the average prices of pig iron, finished steel, metals, etc., in 1912. In addition, tables are included showing the production of various metals in the United States. This issue, which is the sixth edition, contains a re-arrangement of a number of the old tables with a view of presenting these statistics in the most convenient and comprehensive form and a number of new tables also has been added.

The Smith Facing & Supply Co., Cleveland, has been organized to engage in the manufacture of foundry facings and supplies and has purchased the building and machinery of the plant formerly known as the Cleveland Facing Mills, and operated by the J. D. Smith Foundry Supply Co. during the last 12 years. The officers of the company follow: George W. Fleig, president; P. J. Smith, vice president, and J. S. Smith, secretary and treasurer.

Cleaning Castings by the Premium System[1]

The Application of the Bonus Wage Plan in the Cleaning and Finishing Department of a Large Steel Foundry

By A W Gregg

The steel foundry referred to in this article is connected with a manufacturing establishment which builds steam and electric shovels, several types of dredges, pile drivers, dragline excavators and other heavy machinery. The castings made vary from a few pounds to 10 and 11 tons each. Only a little over one-third of the work is standard, and even the so-called standard work is subject to frequent change in the course of improvement in design. In other words the work is practically that of a jobbing foundry.

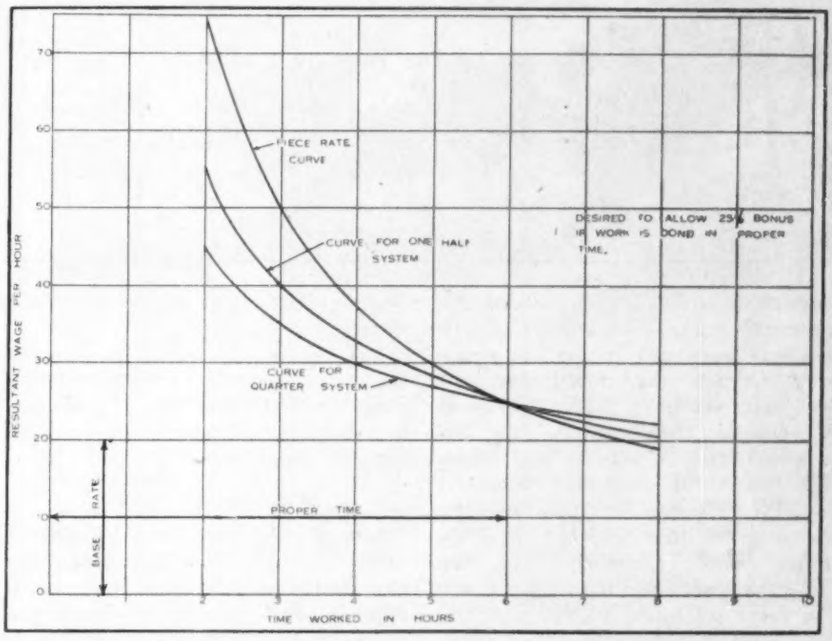
The premium system of payment was introduced for molding several years previous to the proposal to use it in the cleaning room. Molding rates are set on individual jobs after time study, the rate being obtained by adding 60 per cent to the proper time to do the job, the bonus to the molder being one-half the time saved. This gives a man doing the work in the proper time an increase in pay of 30 per cent. The proper time is considered to be the time in which the average good man, working under average good conditions, can do the job, no account being taken of unfortunate circumstances, such as breaking a core, delay for the crane, etc.

How the Foreign Labor Was Interested

The labor employed in the foundry cleaning room is nearly all foreign-born; about one in 20 of them speaks English, and grave doubt was entertained as to the possibility of making this class of labor comprehend the idea of a premium rate. If this fear had been well-founded no results could have been accomplished because the object of setting rates is to increase production and this object is defeated unless the men strive to earn premiums. Also, any premium paid to a man who is not striving to earn it, is a gift. Experience quickly proved that these men could grasp the idea of increased pay for increased output, and that they were more than anxious to earn the extra money.

Undoubtedly the fact that the molding was rated made it far easier to secure the co-operation of the men when rates were set in the cleaning room, as it was generally known among the chippers that the molders earned good wages through the premium system.

The method of premium payment, as finally adopted for the cleaning of castings, will be first described, followed by an explanation of the steps by which it was developed. The work is divided into five natural classes, sand-blasting, saw work, sledge and cold cut work, grinding and air hammer work.



CURVES SHOWING THE VARIATIONS IN WAGES UNDER PIECEWORK, ONE-HALF AND ONE-QUARTER PREMIUM SYSTEMS

The basis selected for setting rates was weight, and curves have been developed expressing the rate plotted against the weight of the casting for the air hammer, grinding and sledge work. The rate is the proper time to do the job plus 100 per cent, the bonus to the man being one-quarter of the time saved; thus permitting a man who does the work in the proper time to earn an increase of 25 per cent in wages. The selection of 25 per cent, which has proved to be ample, was caused by a desire to play safe, for the nature of the work makes it very difficult to determine the proper time. The method of rating sand-blasting and sawing will be mentioned later, as they are handled in a different manner from the other three.

Recording the Working Time

A timekeeper records the work for each man precisely as if the rates were set to pattern mark, keeping a record of the time in which each job is done. The time card has a space for the weight of the casting after its pattern mark, and this is filled in by the time-checker, who then gets the rate from the proper curve and marks it on the card.

The time put in by each man each day is subtracted from the sum of the time limits for the work completed on that day, and one-quarter of the difference is awarded to the man as a bonus.

The premium system of payment has added two men to the clerical force, a time-keeper and a time-checker. If the rates were set to

[1]Presented at the Buffalo meeting of the American Foundrymen's Association.

pattern mark a third man would be necessary to make time studies and set rates, but the selection of weight as the basis and the use of curves obviates the necessity of a rate setter. The points of interest are the quarter system of premium payment and the method by which the curves were developed.

First Experiments in Setting Rates

The first experiments in setting rates in the cleaning room were made on the air hammer work. The time to clean a rather standard casting was carefully studied by the foreman, with two of the best and most intelligent workmen doing the work. After deciding on the proper time, 50 per cent was added, and this rate was given to the men with a careful explanation that half of the time saved would be awarded as a bonus. The output of these two men increased in such a gratifying manner that a dozen or more additional rates were set. After the first payday all the men began to ask for premium work. The curious discovery was made that it was not necessary to tell the men what rate had been set on a job. They were satisfied to know that a rate had been set, and to urge a man to his best efforts it was only necessary for the foreman to pull out his watch, point to a job and utter the magic word *premium.* The men from the start seemed to assume that the rates set would be fair and that hard work would be rewarded by increased pay.

The result of setting rates was so uniformly encouraging that more and more were set. For the first four months the foreman set all the rates and he and his assistant kept time on the work. By the end of this time, 75 per cent of the work going through was kept constantly rated and it was found necessary to employ a time-keeper. Also the task of setting so many rates was taking such a large share of the foreman's time that it was necessary to devise some wholesale method of rating or to secure a man to set rates.

The happy idea of putting the rating on a weight basis was suggested. During the first four months upward of 2,000 rates had been set, and the first step was to go over these rates to see if there was any definite relation between weight and rate. To do this the output per rate hour was calculated for each of the rates which had been set by time study. The rates plotted against the weight of castings gave a surprisingly smooth curve. Naturally, the output per hour in pounds increases very rapidly as the weight of the casting increases.

The curves were checked against the old time cards for several weeks and it was found that the premium earned by the gang as a whole averaged about the same with rates set from the curves as under the individual rates.

However, it was also found that the earnings of some men ran much higher and others much lower than under the old rates and that this variation did not altogether represent a variation in the ability of the men.

The curves, it seemed, would give the total premium earnings for the gang correctly, but the distribution to the individual laborer was not altogether equitable.

The Quarter System

Several methods were considered to overcome this difficulty, but the one finally adopted was the quarter system. Previous to this time the curves had been based (as the individual rates were) on an addition of 50 per cent to the proper time and one-half of the time saved as a bonus.

With the quarter system, 100 per cent is added to the proper time and one-quarter of the time saved is paid as a bonus.

An example will probably be the easiest way in which to show that the quarter system will tend to neutralize the effect of a man getting a lot of jobs which require either more or less than the average amount of work. Suppose the proper time to clean the average casting from a certain pattern is 10 hours. The accompanying table shows the percentage of premium earned under both systems under three different conditions: First, work done in proper time; second, done in much less than the proper time; third, work done in more than the proper time.

Under the quarter system it is evident that a fortunate run of work will not so materially increase a man's earnings, nor will an exceptionally unfortunate run of work so materially decrease them.

Variation in Wages Under Piece Work

To illustrate the same thing in a different manner the curves in the accompanying illustration show the variation in wages under piecework, one-half premium system and one-quarter premium systems resulting from doing a job in different lengths of time. The same conditions are used in each of the three cases, namely, a base rate of 20 cents and a bonus of 25 per cent if the work is done in the proper time. Where the proper time to do a given job can be determined with great accuracy, piecework or the one-half premium system will give the best results, because the reward for increased output and the penalty for decreased output are both greater. But where, as in the case of cleaning castings, the nature of the work makes it impossible to determine the proper time with certainty, the quarter system will give the most satisfactory results, because fortunate jobs will not increase the bonus earned so rapidly, and neither will unfortunate ones cut off entirely the chance to earn premium. It will be noted also that the curves show that the disciplinary effect of the quarter system very nearly approximates that of the one-half system.

Sand Blasting and Saw Work

Air hammer work, sledge work and grinding are all rated by this method of curves and quarter system, the rates being based on the output per hour in pounds. Sand-blasting and saw work are rated in a different way. The sand-blast work had been rated at a definite price in cents per ton for several years previous to the rating of chipping and grinding, and as this was considered to be satisfactory it was not changed. Rating the saw work was a comparatively easy problem, the rate being based on the lineal inches cut per hour and the one-half premium system being used.

Reduced cost and increased output are the principal benefits obtained

APPLICATION OF THE PREMIUM SYSTEM

	Proper time.	Premium rate.	Bonus earned if job is done in proper time. Hrs. Per cent.	Bonus earned if job is done in 4 hours. Much less than proper time. Hrs. Per cent.	Bonus earned if job is done in 12 hours. Longer than proper time. Hrs. Per c't.
One-half system	10	15	2½ or 25	5½ or 137½	1½ or 12½
One-quarter system...	10	20	2½ or 25	4 or 100	2 or 16½

by the premium system of payment. The output per man in the case under discussion has increased about 60 per cent since the men have had an incentive to exert their best efforts. The increase in the average wage has amounted to about 20 per cent. The change in the attitude of the men toward their work is well illustrated by the fact that they are now using at their own request sledges which are three pounds heavier than they had been using before. When working under the old system the foreman was very often compelled to discharge men for grinding sledges on an emery wheel to make them lighter. Such a change of attitude on the part of the men of course makes the work of supervision a far less exacting task, and the increased earnings have resulted in a better contented and more efficient lot of workmen.

Hydraulic Bulldozer

To meet the requirements of shops having to produce heavy axles for automobile trucks and other similar forgings, the Watson-Stillman Co., New York City, has designed a hydraulic bulldozer which is equipped with three rams having a maximum capacity of 200 tons. If desired, the two outside rams may be employed with a capacity of 127 tons or the single middle ram can be used alone, providing a capacity of 56 tons. The upright stop shown at the left in the accompanying illustration is adjusted to its correct position by the nuts on the two horizontal rods. The position at which this stop should set depends on the distance which the bar to be upset is required to extend onto the table. The movable beam shown at about the center of the illustration has four vertical T-slots to which dies or forming tools suitable for the work may be attached. A holding die may also be attached to the fixed beam at the left end of the machine.

The vertical latch lever operates a 2-inch, balanced two-spindle valve, which controls the press. The pull-back cylinder, which returns the moving cross beam to its initial position is not shown in the illustration. The rams for a stroke of 15 inches, the width of the bed plate, is 44 inches; opening between the movable and rigid cross beams, 48 inches; diameter of rams, 11 inches; maximum pressure per square inch, 1,500 pounds and weight complete, 20,000 pounds.

The H. W. Johns-Manville Co., New York City, has established a branch office in the Dooly Block, Salt Lake City.

California Iron Ores

The iron ores of the Pacific coast have until recently received but little attention. Numerous deposits have been known to exist, but they have generally been regarded as too far from centers of consumption and fuel supplies to be worked at a profit and too small to warrant the expense of erecting furnaces within reach. The deposits at Minaret, Madera county, Cal., are said to be among the largest in California and perhaps in the west. They occur on the summits of the Sierra Nevada. Probably next in size, but of greater commercial importance, are the Eagle mountain deposits, in Riverside county, Cal.

The Eagle mountain range is one of a large number of bare ranges of rocky mountains in the Mohave and Colorado deserts. The higher peaks of the Eagle mountains rise about 4,000 feet above sea level, and the edge of the desert that surrounds the range on the west, north and east averages about 1,500 feet above sea level.

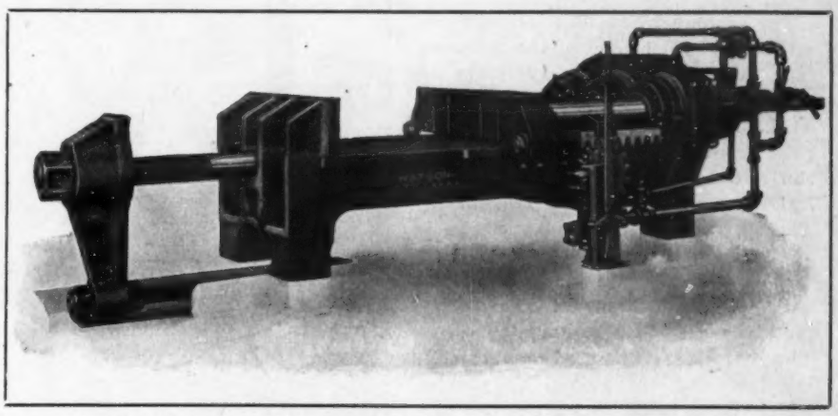
The principal iron ores of the Eagle mountains occur on the north limb of the dome in a chain of discontinuous deposits, 6½ miles long, trending across the summit of the range in a northwesterly direction. They extend 3 miles west of the summit and 3½ miles east. The ore-bearing zone reaches in places a width of 4,000 feet, but individual ore deposits do not exceed 500 feet in width. A moderate estimate of the total quantity of mixed ore and gangue material available in the deposits now exposed, assuming that they extend several hundred feet down, is about 75,000,000 tons. Of this quantity, about four-fifths is assumed to be ore, most of it of very high grade.

No iron ore has been mined in the district, the principal obstacle to the establishment of the iron industry in southern California being the absence of fuel. The nearest deposits of coking coal are in Colorado, the lignites and bituminous coals of Washington and Oregon being unsuitable for this purpose. It seems likely, however, that before many years extensive mining operations will be started in the Alaskan coal fields, and then large quantities of coking coal will be shipped to Pacific coast ports, thus making possible the establishing of blast furnaces and steel plants.

Baryta in Iron Ore

Referring to the article entitled "Baryta in Ore", published on page 110 of the Jan. 2, 1913, issue of THE IRON TRADE REVIEW, I am of the opinion that blast furnace men who have used ores carrying baryta will not agree with the statements made. A furnace can handle more sulphur in the form of baryta and not make bad iron than any other form of sulphur I know of. The sulphate is changed to sulphide and shows up black in the slag. Barium sulphide may be dissolved in water from the slag. An additional property of the slag is that while it may not be lean, it will have a decidedly lean appearance, containing as much as 2 per cent of barium sulphide. Baryta is contained in some Virginia limonites, but it does not prevent the use of these ores in the blast furnace.

J. J. HOWARD,
Berkshire Iron Works, Sheridan, Pa.



HYDRAULIC BULLDOZER BUILT BY THE WATSON-STILLMAN CO.

Unlike most of the useful metals, platinum remained unknown until comparatively recent times. Probably the earliest authentic reference to it is found in a Spanish book published in 1748, in which it is mentioned under the name of platina, as a mineral occurring in the Chocho district of Columbia and which was found admixed with the gold of that district.

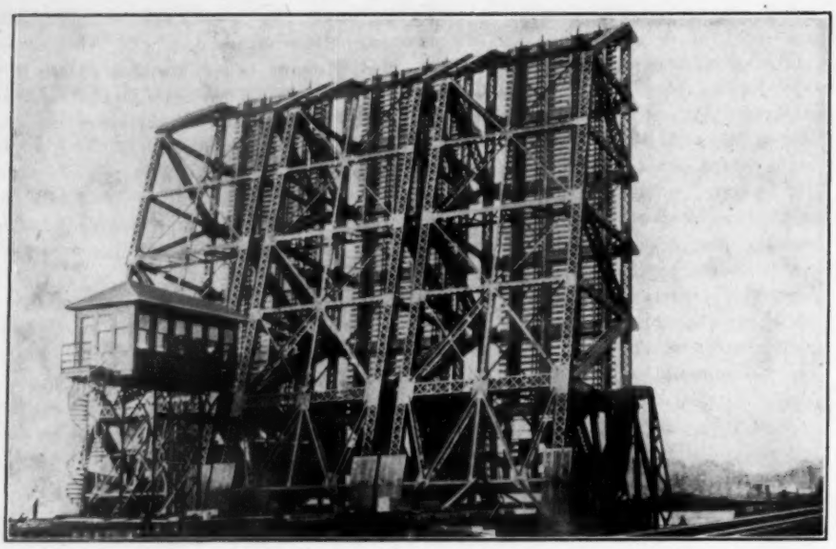


FIG. 1—MOTOR-OPERATED, THREE-LEAF LIFT BRIDGE

Motor-Operated, Three-Leaf Lift Bridge

The accompanying illustrations show a three-leaf lift bridge of the Scherzer type, which carries the six tracks of the Harlem river branch of the New York, New Haven & Hartford railroad across the Bronx and Hutchinson rivers. As shown in Fig. 1, each leaf of this bridge carries two tracks. The six tracks accommodate an average of about 200 trains per day.

Each leaf of this bridge is equipped with two 25-horsepower, 550-volt direct current Westinghouse motors. The motors are mounted on the moving leaf and are geared to pinions which mesh with racks on the stationary part. Some of the details of the mounting are shown in Fig. 2. Either of the motors has sufficient power to operate the leaf alone, though both are ordinarily operated as one unit. Each motor is provided with an electric brake and each leaf has an emergency brake.

At the left, Fig. 3, is shown the conduit which carries the current to the moving part of the bridge. This conduit passes along the upper side of the girder where it is carried into the moving part of the bridge, as shown at about the center of Fig. 3. The mechanism is so arranged that the bridge, which is controlled from a tower, cannot be opened until the signals are set against trains, the derails are opened and the rail locks released. Following this the controllers are operated and at four points in the travel of the bridge signal lamps are lighted. When the bridge is at the proper height a cir-

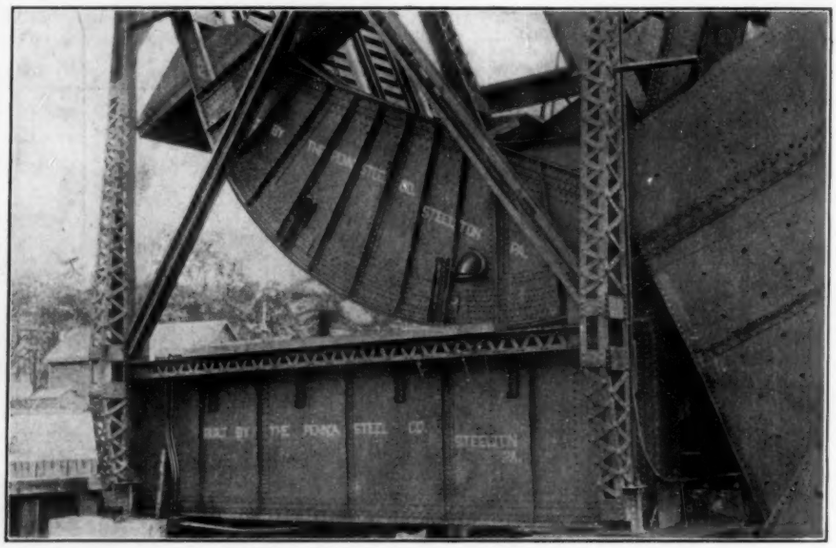


FIG. 3—SIDE VIEW OF ONE LEAF LIFTED

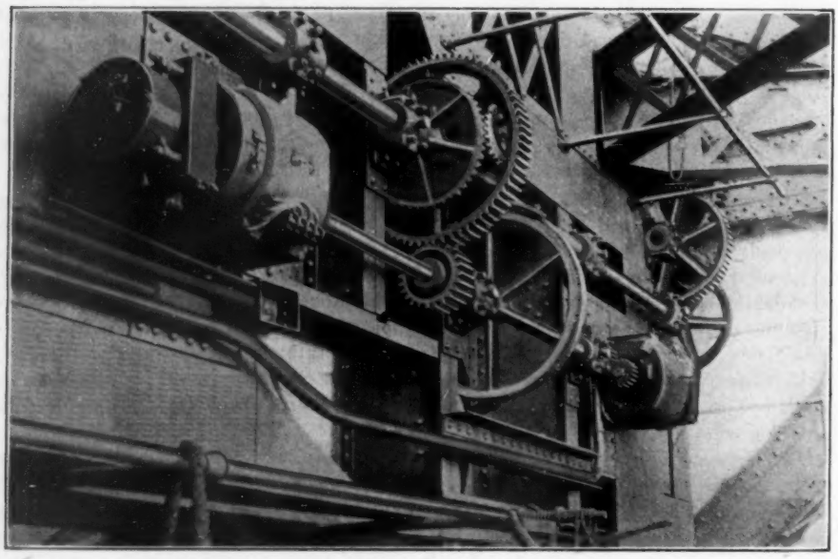


FIG. 2—METHOD OF MOUNTING THE MOTORS

cuit-breaker operates automatically, cutting off the current.

When these bridges were constructed, provision was made for operating them by hand in case the motive power should fail. Compared to opening and closing by power, this would be a slow operation and has never been required.

The gas engine dates practically from the year 1791, when John Barber patented an engine driven by gas obtained by heating wood, coal, oil or other substances in a retort. After the gases had been cooled, they passed through a pump in which they were mixed with air, thence to an "exploder." The gas was lighted at the orifice of this exploder and issued in a continuous stream of flame against the vane of a paddle wheel.

Electric Power From the Mississippi River---II

Engineering Details of the Keokuk Plant With a Description of the Power House and the Turbine Units

The Mississippi River Power Co. is executing a bold project to develop 300,000-horsepower at the Des Moines rapids of the Mississippi river by means of a great dam, extending from Keokuk, Ia., to Hamilton, Ill. It is the largest plant of its kind in this country and is one of the most notable hydro-electric developments that has yet been undertaken. A general description of this project, with a discussion of its commercial and economic features appeared in the last issue of THE IRON TRADE REVIEW. *The accompanying article takes up the engineering details of this great plant, with special reference to the mechanical and electrical equipment of the power house.*

To the engineer interested in the development of hydro-electric power from the Des Moines rapids of the Mississippi river, the geological surveys and hydraulic data which cover the physical fundamentals of the problem are of primary concern. The channel of the river, which skirts southeastern Iowa, is of comparatively recent origin and was originally located some distance to the west. The old channel, however, was dammed at some pre-historic time by the intrusion of a glacier and the river forced to the east. The conditions which caused the river to cut a valley five to ten miles wide in the pre-glacial age were absent in the post-glacial age, when the present channel constituting the Des Moines rapids was cut through. As a result, the bluffs at the rapids are closer to the present river than at any other point south of St. Paul. This allows a dam at Keokuk with a comparatively small area overflowed by the pool above, thus keeping the cost of flood damages within reasonable limits and making the proposition one that is financially feasible. The Des Moines rapids extend for a distance of about 12 miles from Keokuk to Montrose, Ia.; between these points the river bed has a fall of 23 feet. The surface fall is about 23 feet at low water and 16 feet at high water, the greater part of this fall being in the lower eight miles. The river is in a solid limestone formation and its bed is practically smooth, so that there is no broken water or surface disturbance during ordinary stages. The river is nearly a mile wide and has a depth of about 7 feet at mean water.

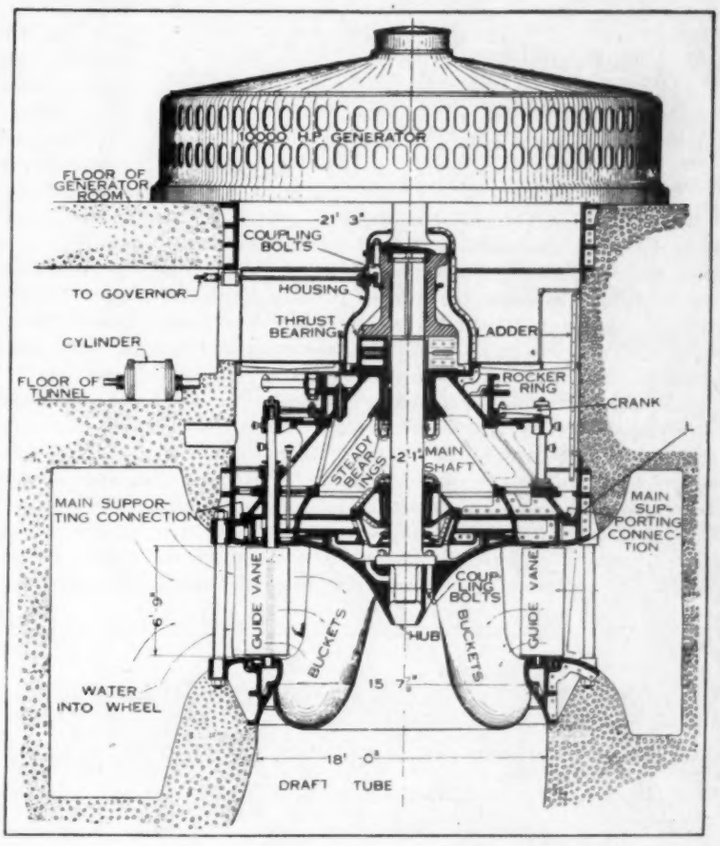


FIG. 1—CROSS-SECTION OF ONE OF THE TURBINE UNITS

Observations extending over a period of 20 years indicate that the volume of water flowing through the river at this point varies from 20,000 cubic feet per second at low water to 372,500 second-feet at flood stage. The mean water level will be raised about 35 feet by the dam and the normal working head on the hydraulic machinery will be 32 feet, although this will vary from 20 to 39 feet from high to low water.

The dam forms a pool 60 miles long above Keokuk and will flood about 3,000 acres of land, about 65 per cent of which is on the Iowa side and 35 per cent on the Illinois side. Practically all of this land was purchased from the owners by private negotiation, over 800 different persons being involved. In only about half a dozen cases has it been necessary to institute condemnation proceedings. The main dam is a concrete structure, extending 4,278 feet from its east abutment, the latter being 290 feet long. The structure is peculiar in that it is being built first as a viaduct and then converted into a dam. At first a series of 119 arched spans, 30 feet long, resting on piers, 6 feet thick, were constructed, forming a bridge from the Illinois shore to the northeast corner of the power house. Later the openings between the bridge piers were filled by concrete weirs, so that in the total length of 4,278 feet of dam there is 3,570 feet of spillway. Unwatering the bed of the river was accomplished by a cofferdam which was kept continually ahead of the construction work on the main dam. The cofferdams were built of timber cribs, loaded with stone, faced with plank and sealed watertight with clay. Special precautions and soundings were taken to fit the cribs tightly to the river bottom.

The water level in the lake may be raised above the crest of the spillway by steel gates which close each 30-foot opening up to the springing line of the arches. The gates

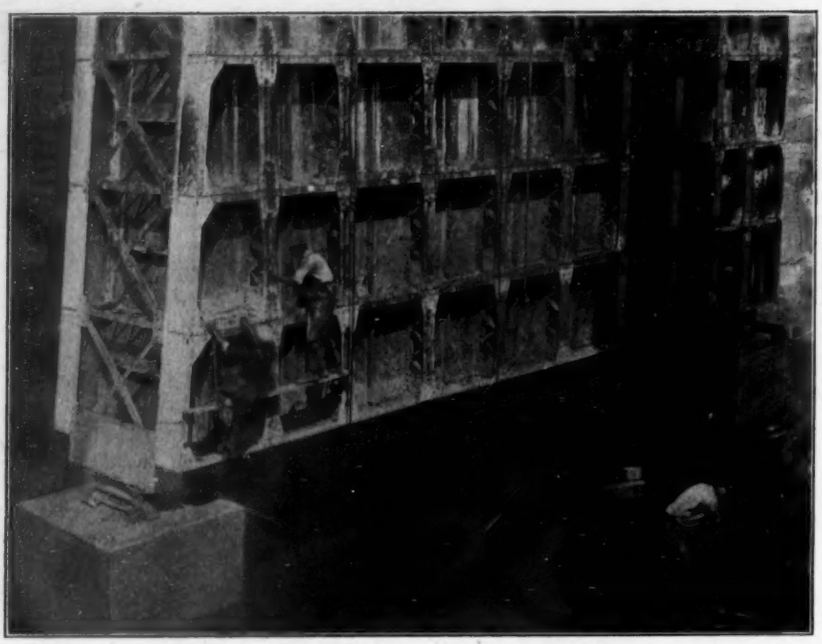


FIG. 2—STEEL FORMS USED IN THE CONSTRUCTION OF THE MAIN DAM

are steel panels, 11 feet high and 32 feet long over-all, and they slide in grooves in the piers. Each gate consists of a framework of 18-inch I-beams, covered with 3/8-inch steel plate on the upstream face. They will be opened and closed by a traveler or derrick car running along the bridge, which forms the top of the dam; to determine the pull which this derrick would be required to exert, one of the gates was set up under actual conditions and allowed to rust fast in its groove for seven weeks. Nitric acid was used to accelerate and increase the corrosion. At the end of the period, the gate was moved by a hydraulic jack, which permitted a measurement of the force required.

Steel Forms for Concrete

One of the special features in the construction of the dam was the use of steel instead of wood forms for molding the concrete. These forms, one of which is illustrated in Fig. 2, were designed by B. H. Parsons, mechanical engineer. They are built of structural steel shapes and are faced on the inner side with steel plates. The forms are made in panels, 5 feet wide, so they may be readily moved by means of block and tackle. Each panel is slightly shorter than the one below, to provide for the batter of the end of the piers. In the upper panels, diagonal members are used so that the structural framing forms a truss. This is done in order that when the lower panels are removed, the upper ones will be sufficiently strong to carry the load of green concrete in the arches.

For the arches between the piers, three steel-hinged trusses, made in two sections with a transverse joint at the crown, were used to carry the curved plate which formed the lagging. All the forms were left in place about a week, with five days as a minimum, to allow the concrete time to set. A complete set of pier and arch forms could be erected in about six hours.

A steel traveler or crane, running along the top of the finished portion of the structure was used in placing concrete ahead of the completed piers. Its weight, 175 tons, was carried by six wheels running on two rails forming a wide track. To operate the machine and the concrete handling tackle, two 10-horsepower and three 40-horsepower steam hoisting engines were employed.

Expansion joints in the dam are provided at each pier by casting a sheet of heavy tar paper on edge in the concrete. The paper lies in the middle line of each pier and extends from the floor of the viaduct down to a level with the bottom of the arches. The paper is elastic and acts as a cushion against which the concrete may expand; when the paper rots out, there will remain an open slot. Elaborate concrete mixing plants have been established on both sides of the river.

A plan of the power house is shown in Fig. 3, and across-section through the axis of one of the turbo-generating units is illustrated in Fig. 1. The power house substructure is practically a solid mass of concrete, 1,700 feet long and 123 feet wide, with its floor 45 feet above the river bed. In this monolith are formed the wheel pits, scroll chambers, draft tubes, etc., carrying the water to and from the wheels. The power house superstructure is reinforced concrete. It will be 125 feet wide and is divided longitudinally, as indicated in Fig. 3, by a wall forming a series of arched recesses in which the transformers will be placed. The generator room will be on the river side of the building. The entire building will have an upper story, or gallery, in which will be placed the oil

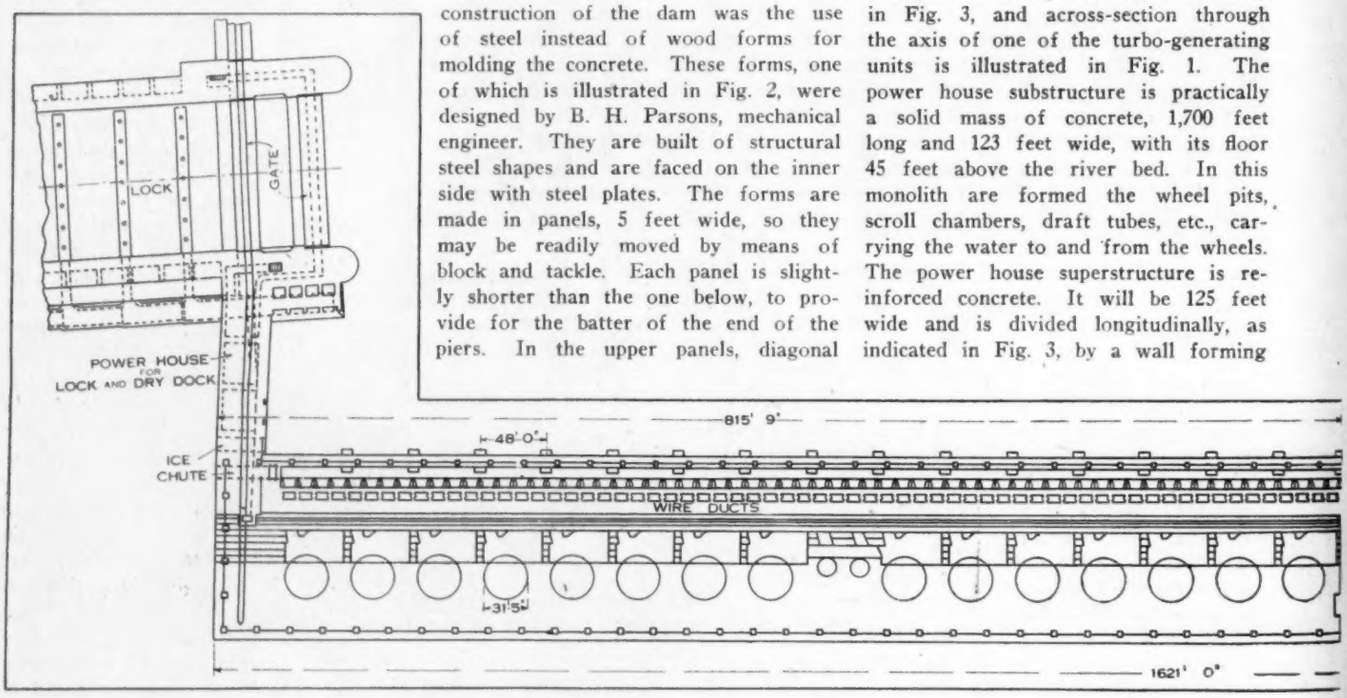


FIG. 3—GROUND PLAN OF THE POWER HOUSE, SHOWING THE 15 TURBINE PROPOSED UNITS WHICH WILL INCREASE THE

switches and other electrical auxiliaries.

For the present, fifteen 7,500-kilowatt vertical generating units and two exciters will be installed. The water from the forebay goes to each turbine through four intake openings, each of which is protected by a screen and guarded by a gate. Three of the intakes merge by easy curves into a common passage, which is tangent to the distributor at a point opposite the axis of the wheel, as indicated in Fig. 4. The three passages and the common one, into which they merge, are all rectangular in cross-section, the floor and roof being level throughout. Water enters the three passages at a velocity of 5 feet per second for normal head and is uniformly accelerated to 7 feet per second opposite the axis of the wheel. From this point the design follows that of an ordinary scroll case and the successive areas around the distributor are such that the velocity of the water is gradually decreased. The fourth intake feeds water to that quarter of the wheel not connected with the scroll case. The division walls are all so arranged as to avoid eddies and swirls.

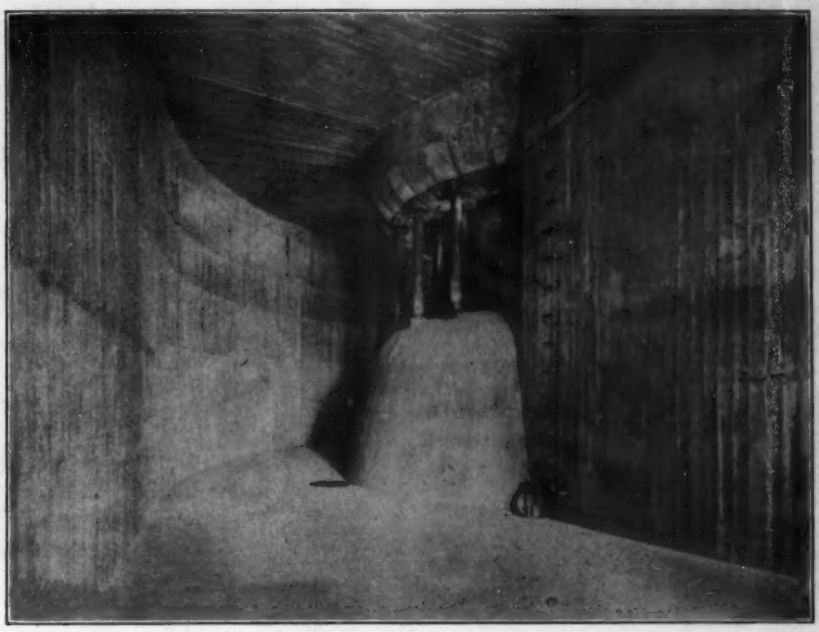


FIG. 4—INTERIOR OF SCROLL CHAMBER

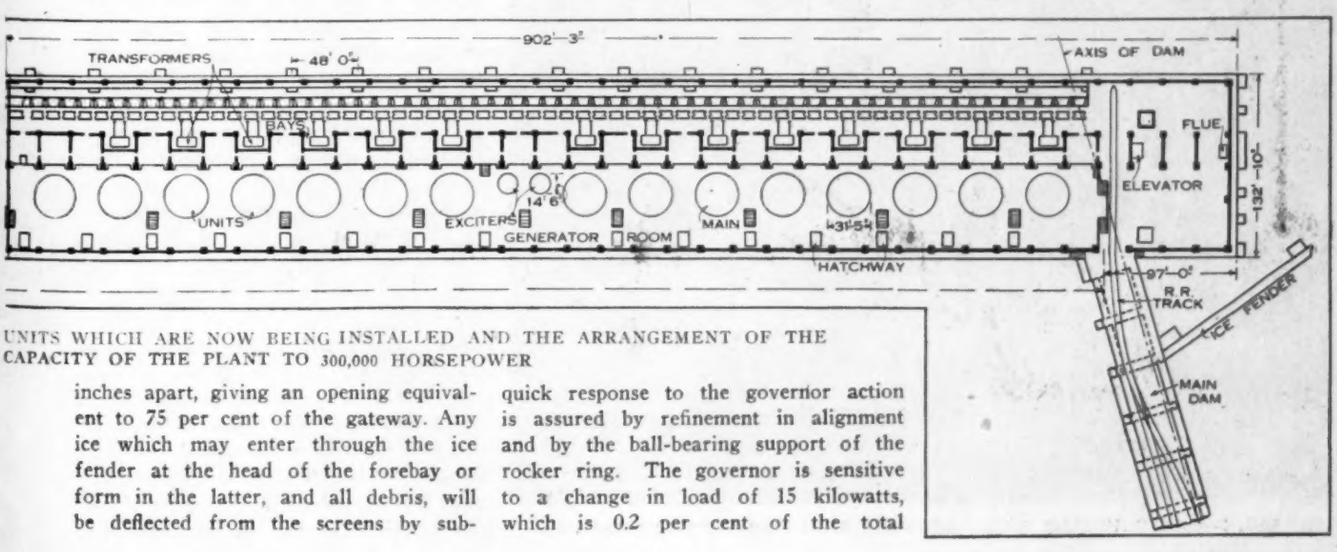
Water Gates

While the size of each intake varies throughout its length, the outer openings are each 7½ feet wide by 22 feet high, thus giving long, narrow gates sliding in cast iron guides. Alignment of these guides, as well as the bearing on the nose of the piers for the guard screens was secured by the use of steel forms in molding the concrete. A traveling crane will be used to operate both gates and screens. The latter are held in place by a cast iron T-section bolted to the buttresses. All structural steel will be removed when the screens are raised, that is, none of it will be permanently submerged. The screens are in four sections, 10 feet, 9 inches high, with 3 x ½-inch bars spaced 6 inches apart, giving an opening equivalent to 75 per cent of the gateway. Any ice which may enter through the ice fender at the head of the forebay or form in the latter, and all debris, will be deflected from the screens by submerged skimmer arches. Suitable ice chutes are provided for disposing of any floating matter that may accumulate in front of the screens. The water wheels are gray iron castings and were described in THE IRON TRADE REVIEW, Feb. 13, page 407.

One of the completed wheels is illustrated in Fig. 6. It is a combined impulse and reaction turbine of the Francis type, designed for low head, ranging from 39 to 20 feet and for a speed of 57.7 revolutions per minute. From the Holyoke tests of the models, the efficiency is assumed to be 86 per cent. The over-all diameter of the runner is 16 feet, 2 inches, and the vertical shaft is 25 inches in diameter. The thrust bearing is provided with a set of rollers in addition to the usual high pressure oil lubrication. Practically all of the bearings are above water and are accessible for adjustment. Easy and quick response to the governor action is assured by refinement in alignment and by the ball-bearing support of the rocker ring. The governor is sensitive to a change in load of 15 kilowatts, which is 0.2 per cent of the total normal load. The water wheel castings were mounted in the shops on their sides in ball bearings and balanced with lead until a 5-pound weight on the circumference would cause the 73-ton mass to rotate.

Foundation Rings

The wheel is placed between two heavy cast iron foundation rings, which are separated by solid 8-inch bolts, as indicated in Fig. 5. Each foundation ring weighs 50 tons. To insure as perfect alignment as possible, each liner was erected on eight 3 x 3-foot concrete pedestals, which temporarily took the place of the separator bolts. Steel screw wedges resting on the pedestals were used to bring the rings into their exact position. The surrounding concrete was then poured and after it had been allowed to set for at least eight weeks, platforms were built on the sup-



UNITS WHICH ARE NOW BEING INSTALLED AND THE ARRANGEMENT OF THE CAPACITY OF THE PLANT TO 300,000 HORSEPOWER

FIG. 5—WHEEL CASING; THIS VIEW ALSO SHOWS THE METHOD OF SETTING THE LOWER, 50-TON, FOUNDATION RING

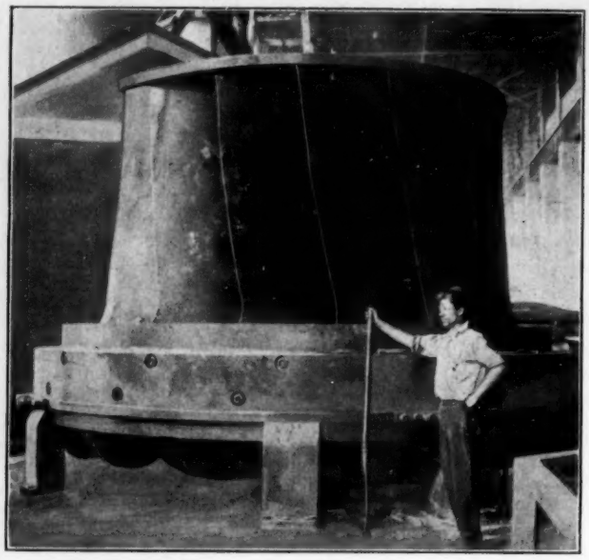


FIG. 6—ONE OF THE 73-TON 10,000-HORSEPOWER WATER WHEELS

porting ledge, *L*, Fig. 1, and concrete blocks piled on them, overloading the upper ring about 100 per cent. Only negligible settlement took place. The instrument work had been done so carefully, that the bearing face of the supporting ledge was level within 1/16 inch. This ledge had been left ⅛ inch high in the shop, and a specially designed boring mill, consisting of a supporting spider carrying a revolving tool holder for vertical and horizontal cutting, similar to mills used to finish the supporting faces for battleship turrets, was then used to bring the surface to within 0.001 inch of level. These refinements make it certain that the shaft will be vertical and that the bearing surfaces will be at right angles to it, conditions necessary for the satisfactory operation of the thrust bearing. The bosses for the separator bolts on the under side of the upper foundation ring were also milled by a special tool after erection, the distance being gaged from the supporting edge after it had been milled true.

Draft Tubes

The water from the wheels flows into draft tubes, Fig. 11, which are 60 feet long at their center lines. At the wheels, the section is an 18-foot circle, gradually opening out to an oblong section at the end. The velocity is gradually reduced in these tubes from 18 to 4 feet per second. The quarter turn from vertical to horizontal is by an easy curve. The foundations of the draft tubes at their outlets are 25 feet below the normal river bed, and the rock in the way has been removed by quarrying to form a tail-race. The latter is fan-shaped in plan, expanding to great width at the downstream end of the power house, beyond which it will gradually disappear into the natural surface of the bed rock.

The speed of each turbine is controlled by 20 cast steel guide vanes, 6 feet, 8¾ inches high by 3 feet, 4 inches wide, connected to a specially-designed Lombard governor. Cranks at the upper ends of the vane-supporting shafts are attached by links to an operating ring, which is carried on ball bearings and revolves against rollers mounted on eccentric bearings for adjustment. Piston rods from two high pressure oil cylinders are attached to the ring at the extremities of one diameter. The maximum stroke of the pistons is 19 inches and the 25-inch diameter oil cylinders, under 200-pound pressure, will develop a power of 250,000 foot-pounds in two seconds. Each guide vane may be removed for inspection or repair by withdrawing its stem vertically, without disturbing other parts of the mechanism. Each vane is supported and its weight carried by a ball-bearing at the top of the shaft. The bottom steady bearing is lubricated from the top by a hole through the shaft.

The governor fly balls and the pump furnishing oil for the thrust bearings are driven by a countershaft geared direct to the turbine shaft. This countershaft is fitted with special couplings to absorb vibration that might otherwise be carried to the governor head. Motor-driven triplex oil pumps furnish

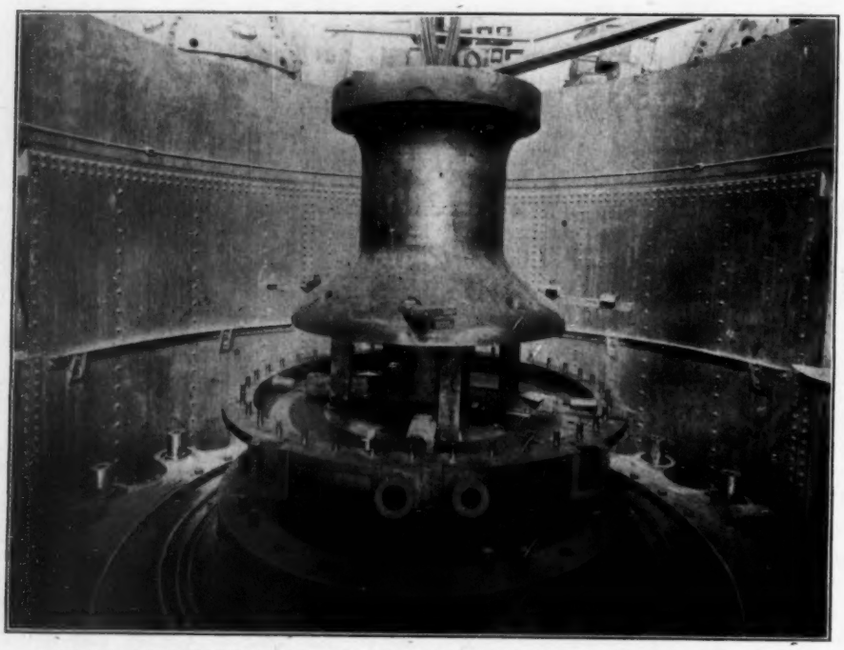


FIG. 7—THE COUPLING SPOOL SURMOUNTING THE THRUST BEARING

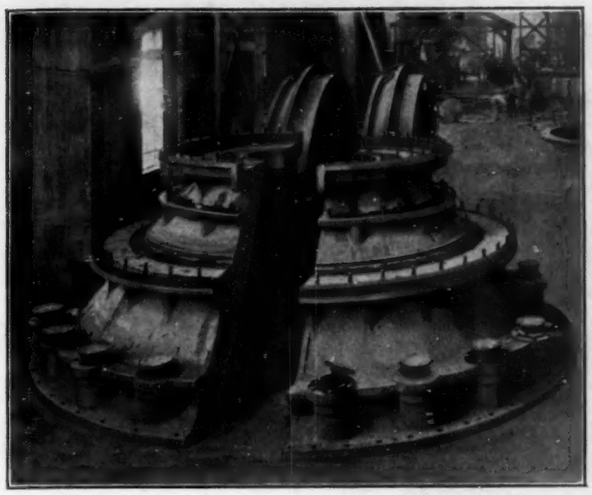


FIG. 8—CONE-SHAPED CASTING WHICH SUPPORTS THE THRUST BEARING OF THE MAIN TURBINE

FIG. 9—GENERATOR FIELD SPIDER READY TO RECEIVE COILS

the oil to the governor cylinders under 200 pounds pressure.

The weight of the wheel shaft and the attached runner is carried to a coupling spool, Fig. 7, by a roundabout key at the top, and a vertical key the whole length of the spool takes care of the torsional stresses. The thrust bearing is interposed between the coupling spool and a cone-shaped casting resting on the supporting ledge of the upper foundation ring, as indicated in Fig. 1. The details of the supporting casting, which is made in halves, are illustrated in Fig. 8. The bearing itself, which is spherical, is provided with both rollers and an oil pressure chamber. Normally the weight will be carried by the oil, but any material drop in pressure or quantity of oil will permit the shaft to settle down onto the rollers, which are always immersed in oil and ready for operation. A special point made in the design of the wheel is that all lubricating devices and all bearings with the exception of the steady bearings of the guide vanes are out of water and accessible.

The Alternators

The alternators, which are being furnished by the General Electric Co., are of the revolving field type with rotors 25 feet, 5 inches in diameter. Each generator has a normal rating of 7,500 kilowatts at 57.7 revolutions per minute. Three-phase, 25-cycle alternating current is made; it leaves the generator at a pressure of 11,000 volts and is stepped-up to the line voltage of 110,000 by individual oil and water-cooled transformers located in cells behind the generating units. The rotor complete weighs 75 tons. The machines were shipped in sections and are being wound and assembled for the first time at the plant. There are 456 individual coils or windings in each armature. The outside diameter of the completed generator is 31 feet, 5 inches; its height at the rim is 7 feet, 2 inches, and 11 feet, 3 inches at the center.

The revolving field spider, Fig. 9, is cast with 12 arms and a wide rim, like a heavy flywheel. The coils are bolted to this spider as indicated in Fig. 13, which shows a completed rotor being set into place. The assembled armature and rotor are shown in Fig. 14.

Excitation current for the generators will be furnished by two 1,500-kilowatt units. Each unit consists of a 2,200-horsepower vertical turbine and generator, similar in general design to the main installations, together with a motor-generator set delivering direct current. The usual array of oil switches, disconnecting switches and remote control apparatus completes the electrical equipment. The switching mechanism is on the second floor of the power house, above the screen room. The generator room is served by two 150-ton Alliance cranes of 60-foot span. The transformer room is also served by heavy traveling cranes.

The Cofferdam

Since the power house occupies a large area in what was formerly the middle of the river, it was necessary to build a cofferdam covering about 35 acres before construction work could be commenced. This cofferdam is composed of 16 x 24-foot timber cribs, which extend about 15 feet above the river bed. Each crib contains about 22,000 feet of lumber and is held in place by loose rock. The cribs are made watertight by sheet piling faced with clay.

In addition to the dam and power house, it was necessary to construct a large lock and dry dock to preserve

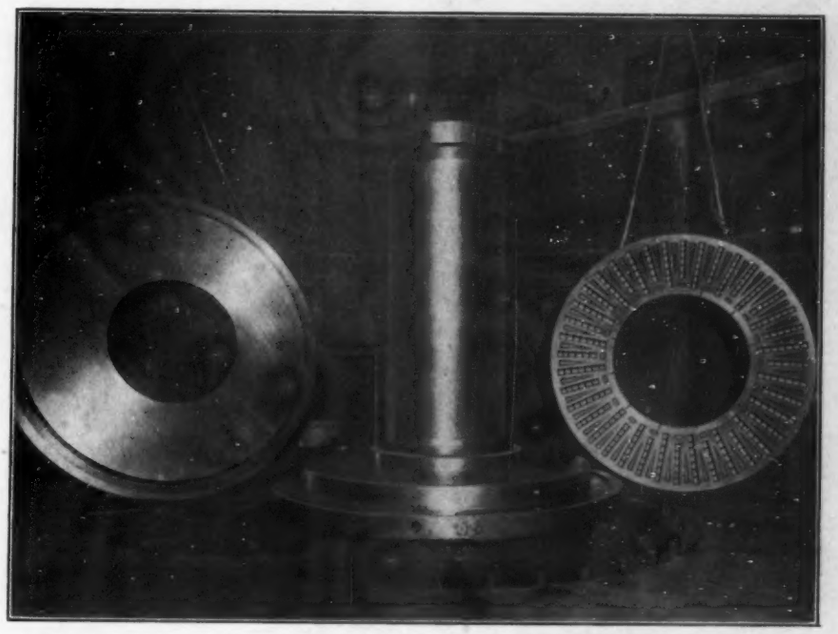


FIG. 10—ROLLER DISC AND UPPER BEARING DISC FOR THRUST BEARING

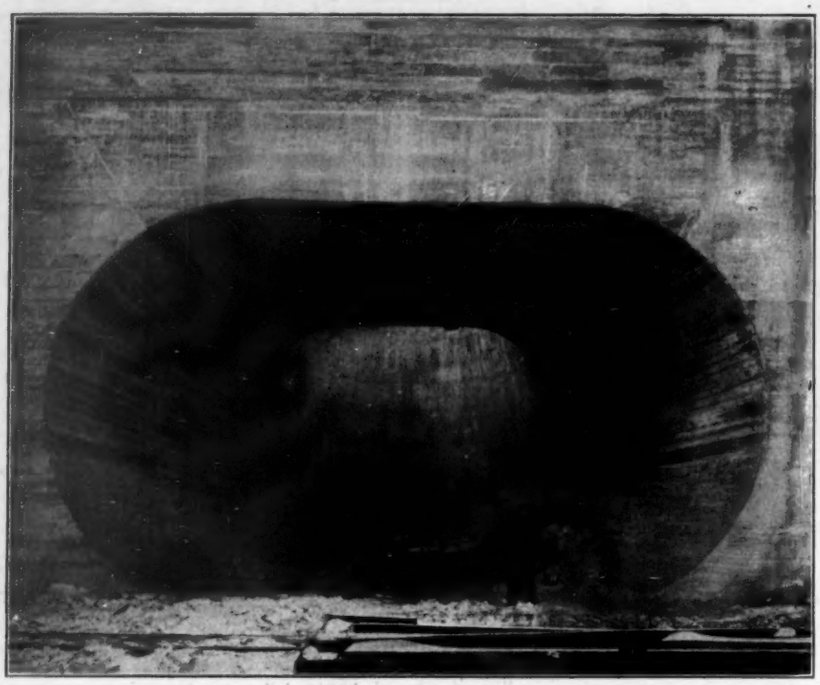


FIG. 11—A COMPLETED DRAFT TUBE UNDER THE TURBINE

the interests of navigation. The lock is 110 feet wide and 400 feet long inside, with a lift of 40 feet. The dry dock is 150 x 463 feet. This portion of the work involves no unusual features. The lower lock gates, which are of the miter type, were fabricated by the Chicago Bridge & Iron Co., Chicago. Each gate has a span of 115 feet and the pivots are hardened steel working in bronze bushings. Compressed air, furnished by two small turbine units, will be used to operate the lock and dry dock machinery.

The construction work is under the supervision of Hugh L. Cooper, vice president and chief engineer of the Mississippi River Power Co. B. H. Parsons, of New York, is the mechanical engineer. The construction work is carried on by two separate and distinct organizations, the Illinois division, under Dexter P. Cooper, superintendent, building the dam, and the Iowa division, under H. T. Herrick, superintendent, constructing the power house, lock, etc. The electrical work is in charge of the Stone & Webster Engineering Corporation of Boston, and when the plant is finished, it will be placed in the hands of the Stone & Webster Management Association for management and future operation.

FIG. 12—GENERAL VIEW OF THE GENERATING ROOM DURING THE CONSTRUCTION PERIOD

Cement for Blast Furnace Hearth and Bosh[1]

By Samuel H. Chauvenet

The two blast furnaces of the Berkshire Iron Works at Sheridan, Pa., were built, respectively, in 1862 and in 1872. No. 1 furnace is 10 x 15 x 80 feet. It was built for the production of charcoal iron and was the old style stone stack, about 25 feet high, with a fire brick lining. It was a hillside furnace with the top on a level with the stock house floor, thereby requiring no hoist. In 1867 a shell was put on this furnace from the top of the stone work, making the total height of the furnace 80 feet. Two 4-inch tuyeres were put in each of the four tuyere arches, the tap hole and cinder notch being in the front arch.

No. 2 furnace is 10 x 16 x 76 feet. Instead of stone the base was a circular mass of red brick, 7 feet thick at the base, through which six tuyere arches were left about 8 feet wide by 8 feet high. On top of this brickwork rests the furnace shell. The total height of the furnace is 76 feet. About 8 feet above the center of the tuyeres the bosh lining strikes the red brick casing, which forms a binder for the top 8 feet of bosh walls. There is a space of 2 feet between the walls of the crucible and the red brick casing. The crucible is bound with 4½-inch tee rails, outside of which is a ¼-inch wrought iron jacket. The jackets and rails are held in place by two circular bands, 2 x 5-inch, each in three segments. On the ends of each segment of the bands are cast steel lugs, through which are put 2½-inch bolts. Lead washers, ¾-inch thick, are put under the heads and nuts of these bolts to take up the expansion. The 4½-inch space between the hearth jacket and the fire brick of the crucible wall is filled with coarse gravel. A circular pipe, perforated, runs around the top of the jacket, from which water is continually sprayed on the gravel. This puts the water directly on the brickwork. The water escapes through holes about one foot above the bottom of the jacket, so that for one foot above the hearth line the furnace is standing in water.

The old salamanders in the bottom of these furnaces are so deep and run so far under the old brick and stone casings that it was impossible to take them out without disturbing the whole support of the furnaces. It was necessary, therefore, to use

[1]From the Monthly Bulletin of the American Iron and Steel Institute.

the salamander as the hearth bottom and also to lay the brickwork of the hearth wall on it. This made such a rough, thick joint that when laid with fire clay we had trouble from breakouts of iron. It occurred to me that, as cement was made under such high temperature, it would stand the hot iron as well or better than fire clay. We laid the first course in pure cement mortar, some of the joints being 3 inches thick. We had no breakouts on these joints, although holding as much as 50 and 60 tons of iron in the 10-foot diameter of the hearth.

In the last relining of No. 2 furnace the foundation for the crucible wall was so rough that we could not cut brick to fit it without very heavy joints of cement. We therefore used concrete made of one part cement, three parts ground fire brick and five parts fire brick broken to ¼ and ½-inch. This we rammed-in, for the bottom of the crucible wall, for one foot in height, when he had a smooth, even surface on which to start the brickwork. The first 2 feet of brickwork above the concrete was also laid in cement mortar and on the outside of the crucible wall we used cement all the way up to the tuyeres. The salamander in the center of the crucible was 18 inches above the hearth line. This furnace has been in blast for 7 months and the concrete base still holds. We have been using cement in this way for the past 12 years and no breakouts have occurred.

Albert Broden, of the Reading Iron Co., Reading, Pa., was so much impressed with our use of cement at Sheridan that when an explosion in the Keystone furnace blew the lining out of the gas flues to the first elbow, he relined both flues with concrete made with cement and blast furnace slag. This has stood perfectly.

E. M. Schmelz, 611 Moffat building, Detroit, has been appointed sales representative in the United States of the Stassano electric furnace, described in THE IRON TRADE REVIEW, Nov. 21, 1912. In this type of furnace, the melting of the metal is accomplished in a closed chamber and in a neutral atmosphere, which insure a high degree of refinement while the consumption of electric energy is correspondingly low. During the past five years, Mr. Schmelz has been associated with the Stassano company in the construction and operation of different European electric furnace installations of this type.

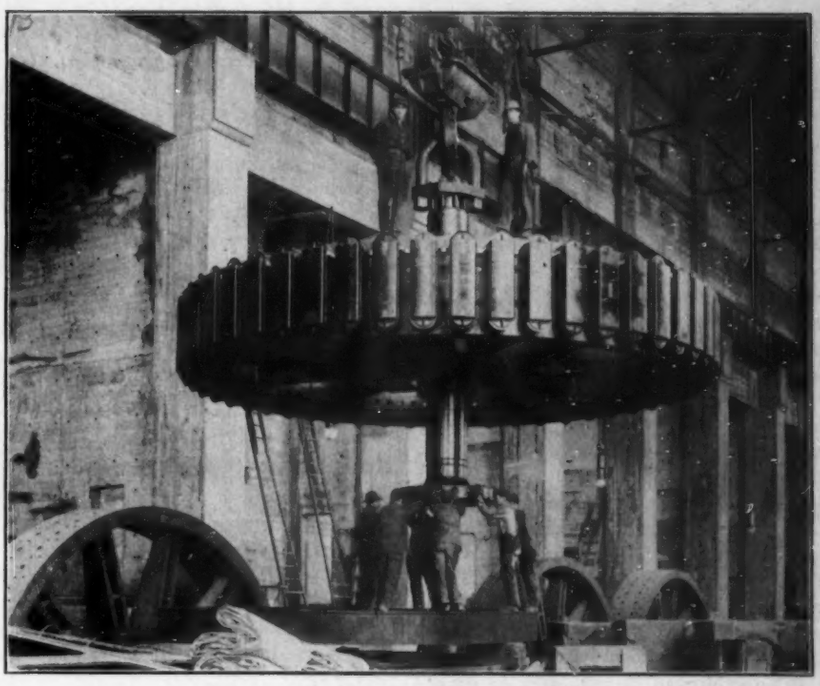


FIG. 13—PLACING COMPLETED ROTOR IN THE ARMATURE OF THE GENERATOR WITH A 150-TON CRANE

Pure Silicon Castings

While it has been known that pure silicon possesses remarkable acid-resisting properties, nevertheless, no use was ever made of this metal because it was not available in commercial quantities and no method was discovered for casting it. The Carborundum Co., Niagara Falls, N. Y., has succeeded in producing silicon metal in large quantities and has reduced the cost of manufacture to such an extent that this metal is given a place among the baser metals and has been taken out of the class of laboratory curiosities. To reduce the silicon from the silica sand, large electric furnaces are employed in which a mixture of coke and pure silica sand is charged. At the high temperature attainable in these furnaces, the reduction of the silica occurs and silicon metal is produced, varying in purity from 90 to 98 per cent. The principal impurities consist of iron and aluminum.

The development of a successful method of casting silicon has been the subject of extended investigation and was effected with great difficulties. The Carborundum Co. recently has succeeded in developing processes

FIG. 14—THE ROTOR AND ARMATURE ASSEMBLED

for making silicon castings of all ordinary shapes and sizes.

The physical properties of cast silicon follow: Density, 2.5 to 2.6; melting point, 1,430 degrees Cent.; boiling point, 2,800 degrees Cent. (calculated); hardness, 6 on Mohs scale; its tensile strength is approximately 1,000 pounds per square inch and it is the least compressible of any metal. Sulphuric acid, in any concentration under gentle evaporation, has no action on silicon. Nitric acid, either dilute or concentrated, has little action on this metal; hydrochloric acid has a slight, but continuous solvent action on silicon, while hydrofluoric acid attacks it vigorously. In practice, silicon metal appears to be highly resistant to chlorine and chlorine liquors, and phosphoric acid shows a continuous, but slight attack, which does not altogether disappear. This results in a slight turbidity in the product treated. However, all alkalis will attack silicon readily.

Silicon is used in the form of pipes for the conveyance of acid gases at high temperatures from stills to condensers, also in the construction of the condensing batteries themselves and proves much more efficient than stoneware. Silicon pipes also are used for the transportation of hot, liquid sulphuric and nitric acids. For lining purposes, this metal is used in centrifugal pumps, acid valves and pipes for the elevation of corrosive liquids by compressed air. Castings are preferably made at least ½ inch in thickness with the exception of pipes less than 2 inches in diameter, which can be made with a ⅜ or ¼ inch wall. Sharp corners and sharp bends must be avoided in designing apparatus to be cast in silicon. Owing to its low specific gravity, silicon is replacing gray iron for acid work, as a silicon casting is approximately only one-third the weight of an iron casting of the same form.

Electric Power in the Connellsville District

The West Penn Traction & Water Power Co. contemplates extensions to its plant at Connellsville, Pa., which already has a capacity of 52,000 horsepower. The electric station operates on coal, which costs about $1 a ton. In addition, the West Penn company is preparing to build three dams in the Cheat river, Virginia, which will produce 50,000 horsepower each. The first hydro-electric plant to be served by this water power will be placed in operation Jan. 1, 1914. Dams also will be built in Sandy creek, West Virginia, where additional hydro-electric plants will be located.

The West Penn company also controls the fall at Ohiopyle, Pa., with reservoir rights on the Youghiogheny river. Ultimately, the electric power available to industries in the Connellsville district will be equal to approximately 300,000 horsepower. The existing power is being transmitted a distance of 120 miles to Butler, Pa., at a voltage of 22,000. A coal mine located 28 miles from the power plant is consuming 3,000 horsepower. A total of 110 coal mines consuming from 200 to 5,000 horsepower each, are being supplied from this plant. With the establishment of the large hydro-electric plant on the Cheat river, a voltage of 110,000 will be adopted for transmitting the current long distance to power plant stations.

Reviews of New Catalogs

ELECTRIC DRILLS.—Bulletins have been issued by the Standard Electric Tool Co., Cincinnati, describing its line of high power, two and three-phase, alternating and direct current drills. These tools are ball-bearing and are of a rigid construction. This line now includes drills from ¼ to ⅞ inch, increasing by ⅛ inch.

LUBRICATION OF PNEUMATIC TOOLS.—An eight-page bulletin, issued by the Chicago Pneumatic Tool Co., Chicago, is devoted to the lubrication of pneumatic tools and contains many valuable suggestions covering the care of these tools to prolong their life at a minimum cost for repairs. Automatic oiling devices are described and a grease machine also is shown.

STEAM SHOVEL REPAIRS.—Manganese steel repair parts for steam shovels and dipper dredges are listed in a catalog issued by the Edgar Allen American Manganese Steel Co., Chicago. Illustrations of manganese steel dipper teeth, dipper lips, fronts and miscellaneous repair parts are shown. It is claimed that great economy is effected by the use of manganese repairs due to their remarkable wearing qualities.

SIMPLEX STEAM PUMPS.—A 48-page, illustrated catalog describes the simplex line of pumps manufactured by the A. S. Cameron Steam Pump Works, New York. In the introductory pages a comparison is made of the merits of simplex and duplex pumps. Diagrams of the steam end and the water valve chest, together with illustrations of numerous types of pumps are included. Tables are given of sizes and rated capacities and also complete instructions for ordering.

WELDING.—A 12-page calendar-booklet has been issued by the Goldschmidt Thermit Co., New York, illustrating many ingenious and successful repairs which have been made by the use of this company's product. Among these are illustrations of welding on the rudder frame of a torpedo boat, the insertion of new teeth in large gear wheels, locomotive frames which had been broken and repaired and various other similar heavy castings which were saved from the scrap heap by this means.

PULVERIZERS FOR SAMPLING. — A four-page folder describing swing hammer pulverizers has been issued by the Jeffrey Mfg. Co., Columbus. These pulverizers are intended for laboratory use in sampling coal, ores, etc. They reduce the sample to a fine powder and it is claimed that by their use a representative and thoroughly mixed sample is always obtained. Direct-connected and belt-driven outfits are listed. The hoppers and sampling chutes have not been standardized as different conditions require radically different layouts.

KEROSENE ENGINES.—Kerosene engines in sizes from 3 to 30 horsepower are illustrated and described in a catalog issued by the Falk Co., Milwaukee. It is said that the growing use of gasoline, with the attendant increasing price, is making the use of kerosene engines imperative from the standpoint of economy. It is also claimed that in this line of engines, the difficulty usually encountered in the proper carboretion of kerosene has been overcome by the use of a special system, the merits of which have been demonstrated by several years' experience. This line includes both hopper-cooled and circulating jacket types of engines.

FUEL ECONOMIZERS.—G. L. Simonds & Co., Chicago, have issued a 16-page, illustrated catalog of appliances for gas analysis and draft regulation of steam boilers. Among the appliances listed is an automatic CO_2 recorder by which the chief engineer or executive may have a continuous record in his office showing the completeness or incompleteness of combustion of the stack gases. Differential draft gages and outfits for the determination of oxygen and carbon dioxide also are shown. The last five pages of the catalog are devoted to other boiler accessories, such as tube cleaners, tube extractors and smoke indicators.

METALS AND ALLOYS. — The Goldschmidt Thermit Co., New York City, in a 32-page booklet describes its various metals and alloys which are produced free from carbon by the thermit process. All of the alloys, with the exception of ferro alloys, are produced technically free from iron and other impurities. The alloys made by this company include ferro-titanium, containing 25 per cent titanium; chromium, 98 to 99 per cent chromium; ferro-chromium, 75 per cent chromium; chromium-manganese, 30 per cent of chromium and 70 per cent of manganese; chromium-copper, 10 per cent chromium; chromium-molybdenum, 50 per cent chromium; manganese, 97 to 98 per cent; manganese-copper, 30 per cent manganese and 70 per cent copper and also 16 2-3 per cent manganese and 83 1-3 per cent copper; manganese-titanium, 30 per cent manganese and 35 per cent titanium; manganese-tin, 50 per cent manganese; manganese-zinc, 20 per cent manganese; manganese-boron, 30 to 35 per cent boron; ferro-vanadium, 30 to 35 per cent vanadium; ferro-molybdenum, 80 per cent molybdenum and ferro-boron, 20 to 25 per cent boron. A large amount of valuable data regarding the properties of these alloys are contained in this catalog.

MEN OF THE IRON TRADE

John E. Bradley, president of the Osgood Bradley Car Co., Worcester, Mass., is on a trip to South America and the Panama canal.

William Bremer, superintendent of the Standard Aluminum Co., Two Rivers, Wis., is making a tour of the east to inspect aluminum rolling mills.

J. H. Gilmore, formerly assistant treasurer and auditor of La Belle Iron Works, Steubenville, O., became secretary and treasurer of the Best Mfg. Co., Pittsburgh, on March 1.

E. J. Monahan, auditor for the Carnegie Steel Co. in the Pittsburgh district, with headquarters at Farrell, Pa., was transferred to Youngstown, March 1, where he will act in similar capacity in the Cleveland district.

James Cooper, for eight years master mason at the Union works of the Carnegie Steel Co., has been made master mason of the Youngstown district of the company, succeeding Thomas Carr, who died recently.

R. E. Daniels, Chicago, has taken charge of the plant of the American Sintering Co., at Hubbard, O., succeeding Charles H. Settel, deceased. Mr. Daniels has been with the American Sintering Co. for some years at Chicago.

A. C. Overholt, resident manager of the United States Cast Iron Pipe & Foundry Co., at Scottdale, Pa., and W. R. Hill, assistant resident manager at that city, have resigned their positions to devote their time to private interests.

G. W. English, formerly associated with the Perry Iron Co., Erie, Pa., has been made general manager of the Zug Iron & Steel Co., Pittsburgh. This position has not been filled since the death of the late C. G. Zug, a few years ago.

A. H. Chave, general purchasing agent of the Canadian Car & Foundry Co., has been appointed general assistant to the executive of the company. Mr. Chave is a director of the Pratt & Letchworth Co. and the Canadian Steel Foundries, Ltd.

Albert S. Smith has been re-elected president and treasurer of the Smith & Mills Co., Cincinnati, O., maker of machinists' tools. James Mills has been re-elected vice president and general manager; J. E. Mills, secretary, and Ernest Mills, superintendent.

H. B. Crile has been transferred from the Virginia and West Virginia agency of the Canton Metal Art Co., Canton, O., to the Pennsylvania district. He formerly was identified with the Massillon Rolling Mill Co., Massillon, O. He is succeeded by Frank Kiley.

Harry B. Guy, formerly connected with the Ohio works of the Carnegie Steel Co., and more recently with the firm of Guy & Cook, manufacturers' agents, Youngstown, O., has been appointed an assistant purchasing agent of the Cambria Steel Co., Johnstown, Pa.

Wm. G. O'Malley, for a number of years general master of mechanics of the Lackawanna Steel Co., Buffalo, N. Y., has accepted a position with the Pittsburgh Crucible Steel Co., having charge of construction work in connection with the building of the new plant at Midland, Pa.

Harry T. Taylor, formerly traveling salesman for the Hill & Griffith Co., Cincinnati, has recently joined the traveling forces of Frederic B. Stevens, Detroit, manufacturer of foundry facings and supplies, and will represent Mr. Stevens throughout Michigan and western Pennsylvania.

Porter Pollock was re-elected president of the William B. Pollock Co., Youngstown, O., at the recent annual meeting. Other officers, all re-elected, are: Charles W. McClure, vice president and general manager; William G. Wilson, secretary-treasurer, and William W. McKelvey, general superintendent.

Henry R. Towne, of the Yale & Towne Mfg. Co., has been re-elected president of the Merchants' Association of New York City. This will be Mr. Towne's sixth term as president of the organization. W. H. Marshall, of the American Locomotive Co., has been made third vice president of the association.

Warren T. Berry, of the Quintard Iron Works Co., New York City, has been appointed superintendent of marine construction of the New England Construction Co., with headquarters at Newport, R. I. He succeeds J. Howland Gardner, promoted to vice president, after 10 years as superintendent.

E. H. Mansfield, formerly representing the Pittsburgh Crushed Steel Co., Pittsburgh, abrasive manufacturer, for several years, has resigned to associate himself as district sales agent to cover the New England territory for the Thomas W. Pangborn Co., Hagerstown, Md., sand blast specialist. His headquarters will be at Springfield, Mass.

George F. Baer has been elected chairman of the Reading Iron Co., Reading, Pa. Other officers elected include: F. C. Smink, president; C. Schuhmann, vice president; George W. Delaney, secretary, and Frederick Butler, treasurer. The directors elected are George F. Baer, F. C. Smink, E. T. Stotesbery, Samuel R. Seyfert and Heber L. Smith.

K. Rosholt has been elected president of the Northwestern Steel & Iron Works, Eau Claire, Wis. T. W. Rosholt has been elected vice president and E. R. Hamilton, secretary-treasurer. Directors elected by the stockholders at the recent annual meeting are: O. H. Ingram, J. T. Barber, E. B. Ingram, C. T. Bundy, K. Rosholt, T. W. Rosholt and E. R. Hamilton.

E. C. Converse has resigned from the Guarantee Trust Co. of New York and it is reported that he contemplates retiring from the boards of numerous other corporations with which he is now associated. He is a director of the United States Steel Corporation, of the National Tube Co., of the National Tube Works Co., of Manning, Maxwell & Moore, Inc., and of other industrial and financial companies. Mr. Converse for many years was active in the management of the National Tube Co. and its predecessor, the National Tube Works Co. In connection with Wm. N. Cromwell, he originated a plan for the amalgamation of various iron and steel tube companies and later acting in behalf of J. P. Morgan & Co., syndicate managers, brought about the merger of various pipe and tube plants, which, with various properties afterwards acquired, formed the National Tube Co. Mr. Converse served as president of the combined interests. His term as a director of the Steel Corporation expires this year.

THE IRON TRADE REVIEW

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Ohio's Radical Departure

The Ohio legislature has passed and the governor has signed a workmen's compensation bill which makes it compulsory for employers of five or more workmen to contribute to the state insurance fund, or, under very severe conditions, carry their own insurance, or form mutual insurance associations. If employers elect to carry their own insurance, they must be of "sufficient financial ability and strength to render certain the payment of compensation to injured employes or to the dependents of killed employes, and the state liability board may require bond from employers as it may deem proper." Probably the United States Steel Corporation will be able to qualify under the stringent regulations just mentioned, but it is doubtful whether many other companies will be able to meet these requirements. It is further provided that the employers electing directly to compensate their injured and the dependents of their killed employes shall pay into the state insurance fund 10 per cent of the amount which they would be compelled to pay if they had elected to have their liability covered by the state insurance fund. It is claimed for this last provision that it is intended to insure the payment of damage in the event of an employer failing to do so, but in view of the fact that the law requires that a company, before attempting to carry its own insurance, must be so strong that payment of damages will be *certain*, this 10 per cent provision looks very much like an imposition of a penalty to drive employers to accept the state insurance plan in its entirety.

One of the important provisions is that when an employer is depending upon the state insurance fund to meet his liability obligations, or has been authorized directly to compensate his employes, and a personal injury is suffered or death caused on account of the failure of the employer or any of his agents to comply with any lawful requirements for the protection of the lives and safety of employes, then nothing in the law shall affect the civil liability of such employer and the employe may bring suit to recover damages. In such action, the defendant may plead the defense of contributary negligence and the fellow servant rule, but may not set up the defense of assumption of risk. The attorney-general of Ohio last year ruled that it is against public policy and therefore unlawful for any employer to insure against his liability for damages resulting from violation of safety statutes by himself or by his agents. The new act is framed in harmony with this decision, and much may be said in support of this view, for certain it is that the state ought not to encourage anything that will cause a lack of vigilance in fully protecting employes. On the other hand, it does seem as though the employer ought to be able to protect himself against his own unintentional violations of statutes and countless regulations of state officials, and against his liability for violation of such regulations by his employes and agents.

The creation of what amounts practically to a state monopoly is, we believe, unjustified and unwise. Only Norway and the state of Washington have made such radical innovations. If the liability companies had been allowed to continue under fair conditions, the competition with the state would have had a good effect. With the law as it is, much will depend upon the honesty and wisdom with which it is enforced. If the state liability board will absolutely exclude the influence of spoils politicians of all parties, much will be done to insure efficient enforcement of the act. Certain it is that the old methods have proved highly unsatisfactory to both employers and employes and the liability companies cannot wholly escape responsibility for the failure. The people have demanded a change, and as the result of tremendous public sentiment in favor of more adequate compensation for injuries and deaths, the states are rapidly passing various kinds of workmen's compensation bills. This legislation is certain to be defective, for many problems connected with compensation of employes remain to be solved. Progress is, however, being made, and with employers co-operating to their full ability, even when, as in the case of Ohio, they have reason for complaint, much more progress will be made, conditions in the work shops of the country will be

greatly improved, and the relations of employers and employes will become more cordial.

Record Steel Exports

Official returns show that iron and steel tonnage exports in 1912 amounted to 2,948,466 gross tons, against 2,187,724 tons in 1911 and 1,540,895 tons in 1910. The year's total falls a trifle short of estimates of two months ago, because exports have been slightly less in recent months than from May to August, when they were exceptionally heavy. The December exports, however, were 235,931 tons, while November showed 235,931 tons, the two months showing an average rate of 2,820,000 tons a year.

Included in the tonnage reported for 1912 are 105,508 tons of scrap and 272,676 tons of pig iron, with 5,912 tons of cast radiators and house-heating boilers, leaving 2,564,370 tons of other products, which are practically altogether steel.

The gain of 1912 over immediately preceding years is striking, particularly as compared with the relatively slow growth in previous years. A dozen years and more ago we had some large exports, even passing the million-ton mark in 1900, but those exports were largely of the dumping variety, and were principally pig iron and unfinished steel. The present export trade is strictly a commercial proposition, conducted for direct profit. As regards perhaps the major portion of the trade last year, the realized prices at foreign seaboard were higher than prices realized at mill in the domestic trade, while in not a few cases the realized prices at mill were higher for export than for domestic business.

Very Interesting Facts About Rails

Thirty-one years ago, the United States made more Bessemer steel rails than it did in 1912. The fact underlying this remarkable statement is brought about by two factors; first, that rail production has grown very slowly, as compared with production of other iron and steel products, and second, that Bessemer steel has yielded very rapidly to open-hearth in the past four years, particularly as regards rail material.

First, as regards the increase in rail production. In 1887, the United States made 2,139,640 tons of rails (of which 20,591 tons was iron), while it was 12 years until a new record was made, with 2,272,700 tons in 1899. During the next seven years, production increased rapidly, until the record of 3,977,887 tons was reached in 1906. In the past six years, we have not been able to break that record. The 1912 production, 3,327,915 tons, just announced officially, fell short of it by 16 per cent, while it exceeded the production of 1887, the record year for so long, by only 55 per cent. From 1887 to 1912, however, the production of pig iron increased 370 per cent, being multiplied almost by five.

The cause of this relatively slow increase in rail production is that thus far rails have been made chiefly to lay in new track. The wear, while considerable on stretches of track, where the density of traffic is great, is small in relation to the total trackage. By far the major portion of all the steel rails which have been laid in the United tates since the outset are still in service. Indeed, the consumption of rails in the United States, the tonnage laid, has increased much less than the production, for we used to import heavily whereas now we export. In 1887, imports were 137,830 tons and exports 549 tons, making the apparent consumption 2,276,921 tons, whereas in 1912 we imported 3,780 tons and exported 446,473 tons, making the apparent consumption 2,885,222 tons. These figures show an increase in consumption, from 1887 to 1912, an even quarter century, of less than 27 per cent!

It is interesting to observe the vitality of an idea. The time was that steel rails constituted the backbone of the steel trade. A good rail year meant a good year all around. The Bessemer steel industry, indeed, was based almost wholly upon the demand for Bessemer steel rails. *Par excellence*, Bessemer steel was the material for rails. Billets rose to $44 a ton in the boom year 1899, chiefly because an enormous tonnage of rails had been sold for that year and the interchangeable mills were making rails and therefore could not make billets. All this is history. Rails are a fairly important product of the steel industry, but not a particularly important one. Nevertheless, there has been constant remark in the steel trade in recent months that rail demand was heavy, hence the steel industry is absolutely assured of prosperity. The fact is that it is questionable whether even in this year rail production will equal the record made seven long years ago.

To return to the fact that the production of Bessemer rails in 1912 was less than the production in 1881, the second important cause for such a remarkable development is the extremely rapid trend towards open-hearth rails. The record year for rail production, as just remarked, was 1906, with almost 4,000,000 tons produced, but only 186,413 tons of that total, less than 5 per cent, was open-hearth. The next year saw a quarter million tons, the next year a half million, and 1909 rose to the dignity of seven figures. In 1910, there was a further gain, while in 1911 Bessemer lost greatly and open-hearth a trifle. In 1912, the production was as follows: Bessemer, 1,099,926; open-hearth, 2,105,144; electric, 3,455; unclassified, 119,390; total, 3,327,915.

The unclassified production is in re-rolled or renewed rails. Excluding this tonnage, the proportion is almost two to one in favor of open-hearth, yet it was only the year before that open-hearth passed Bessemer and six years before the proportions had been 95 per cent Bessemer and 5 per cent open-hearth.

It would be interesting to speculate what would have occurred if the steel manufacturers had not been so prompt to build open-hearth rail mills. Certain it is that there has been an enormous capital outlay by the steel industry, whereby the railroads are given open-hearth rails in place of Bessemer, at a premium over Bessemer of only $2 a ton, and at prices substantially the same, in the present market, as are obtainable for Bessemer wire rods and Bessemer sheet bars. It will be a long time, if present market conditions continue, before the steel interests are repaid for this particular capital outlay. It is not meant by this that there is not a satisfactory profit in open-hearth rails, but that larger profits are obtainable in other products, which have not involved the same capital outlays.

Independents Exceed Corporation in Shipments

Great Movement From the Lake Superior Ranges—Activity Continues at Hill Properties—Decrease in All Rail Tonnage

The independent ore mining companies in 1912 shipped more ore from the Lake Superior district than the Steel Corporation, and in addition reached the highest relative position attained at any time during the period from 1905 to 1913. The independents last year shipped 50.54 per cent of the season's shipments, compared with 47.3 per cent in 1911.

The shipments in 1912, as shown by the official figures just compiled by THE IRON TRADE REVIEW, were 48,211,778 tons, as against 32,793,130 tons in 1911, a gain of 15,418,648 tons. The movement by lake was 47,435,777 tons, compared with 32,130,411 tons in 1911, a gain of 15,305,366 tons. The all-rail shipments last year were 776,001 tons, against 662,719 tons in 1911, a gain of 113,282 tons.

Last year easily established a new record for ore shipments, 1910 having been the previous record-holder with a movement of 43,442,397 tons, showing a gain last year of 4,769,381 tons. The lake shipments in 1912 also established a new high mark, showing a gain of 5,583,020 tons over 1910 with 42,628,758 tons. The all-rail shipments last year were smaller than in 1905, 1907, 1909 and 1910.

In but one other year since 1905 have the independents shipped more than half of the season's movement, that being in 1910, when they shipped 50.14 per cent. In 1907 and 1908 they shipped only 44 per cent, while in 1906 the percentage was 47. In 1909 they shipped 49.64 per cent, showing that with the exception of 1911, a poor year, the independents' shipments have held their own with the Corporation's since 1908.

The record was established in the face of the tremendous activity shown by the Corporation in mining on the properties covered by the "Hill ore lease". Shipments from those properties last year almost equaled the total movement since the lease was secured seven years ago. The total output of the Corporation last year also set a new mark, further emphasizing the growing importance of the independent mining companies.

Under the "Hill ore lease", the minimum tonnages to be mined were as follows:

	Gross Tons.
1907	750,000
1908	1,500,000
1909	2,250,000
1910	3,000,000
1911	3,750,000
1912	4,500,000
1913	5,250,000
1914	6,000,000
1915	6,750,000
1916	7,500,000
1917	8,250,000

The minimum required to be mined up to the beginning of 1912 was thus 11,250,000, while the actual shipments were only 7,832,138 tons. The shortage at the beginning of last year was, therefore, 3,417,862 tons and the required minimum for 1912 was 4,500,000, necessitating a movement of 7,917,862 tons to satisfy the terms of the lease for the period from 1906 to 1913. Official figures have not yet been issued, but the shipments last year were close to 7,000,000 tons, making the shortage to Jan. 1, 1913, only about 900,000 tons. The minimum requirements for the next two years are 11,250,000 tons, so that the total tonnage to be shipped before the lease expires, Jan. 1, 1915, is 12,150,000 tons.

The principal shippers from the Hill lands for the last three years are as follows:

	1912 Gross tons.	1911 Gross tons.	1910 Gross tons.
Dale	1,106,808	1,002,292	.....
Harold	187,926	281,293	27,711
Hill	1,188,908	1,550,568	801,088
Leonard	2,198,119	1,293,463	795,431
Mace	136,524	124,721	15,267
Mississippi	274,729	328,601	36,581
Uno North	545,033	479,315	341,939
Uno South	1,305,216	266,390	.....
	6,943,263	5,326,643	2,018,017

The shipments from the Hill properties in 1907 were 137,270 tons; in 1908, 508 tons; in 1909, 41,624 tons; in 1910, 2,152,977 tons; in 1911, 5,499,759 tons.

A new record was set by the Mesabi range, which last year shipped 32,047,409 tons, a gain of 9,953,877 tons over 1911 and nearly 3,000,000 tons above its best previous record made in 1910. Its percentage of the total shipments was 66.47, against 67.37 in 1911. The Gogebic range also established a new high mark, shipping 4,996,498 tons, against 2,603,318 tons in 1911, a gain of 2,393,180 tons and 681,184 tons more than in 1910, its best previous year. Its relative percentage was 10.36, compared with 7.94 in 1911. The Marquette, Menominee and Vermillion ranges failed to equal their best previous records, shipping 4,202,308, 4,711,440 and 1,844,981 tons, respectively. Their relative percentages were 8.72, 9.77 and 3.83, respectively, compared with 8.64, 11.93 and 3.32 in 1911. The Cuyuna shipped 305,111 tons, against 147,431 tons in 1911, the percentage of the total shipments being 0.63 against 0.45 the preceding year. The accompanying table shows the relative production of the different ranges in the years named.

COMPARATIVE SHIPMENTS BY RANGES, 1912 AND 1911.

	1912.	1911.	Increase.
Mesabi	32,047,409	22,093,532	9,953,877
Gogebic	4,996,498	2,603,318	2,393,180
Menominee	4,711,440	3,911,174	800,266
Marquette	4,202,308	2 833,116	1,369,192
Vermillion	1,844,981	1,088,930	756,051
Cuyuna	305,111	147,431	157,680
Miscellaneous in Wisconsin	104,031	115,629	11,598†
Totals	48,211,778	32,793,130	15,418,648
By lake	47,435,777	32,130,411	15,305,366
By rail	776,001	662,719	113,282

†Decrease.

The following table shows the shipments and percentage of the Oliver Iron Mining Co., the Corporation's mining organization, from 1905:

Year.	Gross tons.	Percentage.
1906	20,414,811	53
1907	22,710,898	56
1908	14,123,957	56
1909	21,397,866	50.36
1910	21,661,143	49.86
1911	17,282,499	52.7
1912	23,845,363	49.46
Total	141,436,537	51.64

Eleven mines shipped more than a million tons each last year, they being the Canisteo, Dale, Genoa, Hill, Hull-Rust, Leonard, Mahoning, Sauntry-Alpena and Uno South on the Mesabi; the Norrie group on the Gogebic and the Cleveland-Cliffs group on the Marquette. Six attained that figure in 1911 as follows: Canisteo, Dale, Hill, Leonard, Mahoning and Sauntry-Alpena, all Mesabi properties. All but the Mahoning and Canisteo that year shipped a million tons each for the first time. In 1910, nine mines shipped more than a million tons each, they being the Adams, Burt, Canisteo, Fayal, Hull-Rust, Mahoning and Morris on the Mesabi, and the Newport and Norrie group on the Gogebic.

The Hull-Rust again swung back into

OFFICIAL STATISTICS SHOWING SHIPMENTS FROM LAKE SUPERIOR DISTRICT IN 1912 AND 1911

MESABI RANGE

	1912.	1911.		1912.	1911.		1912.	1911.		1912.	1911.
Adams	993,523	411,268	Genoa	1,315,840	923,477	Lincoln	173,979	208,556	Schley	159,126	120,365
Adriatic	102,478	73,280	Gilbert	135,622	.....	Mace	136,524	124,721	Scranton	254,500	.....
Agnew	101,498	153,425	Glen	.....	113,512	Madeira	46,494	56,075	Section 17	4,203	.....
Albany	244,669	132,572	Grace	60,641	.....	Madrid	26,906	.....	Sellers	.....	87,275
Alberta	1,455	22,108	Grant	399,848	350,475	Mahoning	1,518,643	1,011,945	Seville	6,023	.....
Bangor	130,997	119,508	Hanna	211,822	26,252	Malta	2,817	10,608	Shenango	805,413	732,978
Bessemer	136,010	179,051	Harold	187,926	281,293	Mariska	.....	2,367	Sliver	378,541	167,225
Biwabik	312,378	211,071	Hawkins	473,120	239,965	Meadow	10,629	.....	Spruce	740,801	638,180
Bray	164,732	.....	Hector (Hale)	.....	20,624	Miller	301,518	282,636	St. Paul	42,597	.....
Brunt	215,585	136,531	Higgins	.....	250	Minnewas	.....	295	Stevenson	682,514	500,323
Burt	.....	56,506	Hill	1,188,908	1,550,568	Minorca	37,235	67,942	Susquehanna	583,910	147,741
Canisteo	2,099,880	1,340,378	Holman	919,699	779,889	Mississippi	274,729	328,601	Union	213,829	.....
Cavour	47,919	1,104	Hudson	224,548	67,278	Mohawk	161,539	121,822	Uno North	545,033	479,315
Chisholm	695,859	721,784	Hull-Rust	2,232,112	496,977	Mon'ca	92,754	112,952	Uno South	1,305,216	266,396
Clark	500,768	500,999	Humphrey	133	.....	Morris	395	40,481	Utica	223,006	100,123
Commodore	576,855	294,787	Iroquois	80,000	43,310	Morton	5,948	.....	Victoria	.....	43,557
Corsica	196,188	63,940	Kellogg	127,412	113,038	Myers	101,558	93,203	Virginia Group	619,594	648,588
Crosby	188,368	18,439	Kinney	530,080	455,836	Onandaga	.....	63,798	Virginia (P., M., & Co.)	200,182	97,667
Croxton	146,290	10,491	Knox	101,169	.....	Pearce	.....	35,343	Wacootah	129,073	7,805
Cyprus	100,063	81,178	La Belle	14,896	14,743	Pearson	75,969	75,696	Webb	166,636	20,237
Dale	1,106,808	1,002,292	Larkin (Tesora)	16,542	2,668	Penobscot	.....	189	Whiteside	275,915	130,198
Elba	168,990	165,055	La Rue	155,552	30,141	Perkins	60,523	44,933	Williams (N. Cinci.)	39,274	11,250
Elizabeth	392	36,268	Laura	270,411	238,824	Pettit	157,208	129,776	Winifred	91,806	52,385
Euclid	49,590	56,796	Leetonia	368,301	353,063	Platt	.....	12,382	Woodbridge	68,089	.....
Fayal	468,019	434,364	Leonard	2,198,119	1,293,463	Roberts	12,384	.....			
Fowler	204,584	85,506	Leonard-Burt	.....	100,723	Ruddy	36,551	5,660			
Franklin	69,993	66,351	Leonard-Glen	15,932	82,709	Sauntry-Alpena	1,025,301	1,057,819	Total	32,047,409	22,093,532

MENOMINEE RANGE

	1912.	1911.		1912.	1911.		1912.	1911.		1912.	1911.
Antoine (Clifford)	.....	74,138	Chicagon	149,619	108,947	Groveland	14,320	31,907	Pewabic	279,769	352,608
Aragon	244,894	201,187	Commonwealth (Buckeye)	49,964	.....	Hemlock	126,132	107,752	Ravenna	18,301	.....
Armenia	150,808	51,863	Cortland	17,498	.....	Hiawatha	220,106	116,736	Riverton Group	177,496	198,589
Baker	.....	3,290	Crystal Falls	665	710	Hollister	.....	5,021	Tobin	319,318	308,457
Baltic	100,736	66,502	Davidson	126,207	45,434	James	75,702	50,439	Tully	.....	8,324
Berkshire	33,419	22,273	Dunn	242,304	232,093	Loretto	136,045	18,655	Virgil	2,996	.....
Bristol (Claire)	435,619	322,647	Florence	99,682	95,266	Mansfield	.....	54,646	Vivian	28,800	5,971
Calumet	35,587	.....	Fogarty	84,074	67,616	McDonald	1,384	5,240	Wickwire	40,417	1,919
Caspian	306,913	165,660	Genesee (Ethel)	4,248	25,342	Millie	1,165	17,040	Youngs	83,528	89,451
Chapin	327,571	357,598	Gibson	.....	57,100	Munro	20,100	9,303	Zimmerman	189,482	112,029
Chatham	134,079	58,056	Great Western	3,342	84,339	Penn. Iron Mining Co.	429,150	377,026	Total	4,711,440	3,911,174

MARQUETTE RANGE

	1912.	1911.		1912.	1911.		1912.	1911.		1912.	1911.
American (Sterling)	133,306	194,979	Gwynn	.....	197	Mary Charlotte	260,801	343,434	Rolling Mill	115,784	96,585
Austin	102,530	105,078	Imperial	54,053	84,843	Milwaukee-Davis	11,537	7,781	Star West (Wheat)	.....	4,466
Beaufort (Ohio.)	.....	2,684	Jackson	50,166	52,615	Mitchell	21,141	21,387	Stegmiller	50,963	45,122
Breitung Hematite	122,320	139,582	Lake Angeline	151,910	167,258	Morris	1,286	.....	Stephenson	214,386	128,839
Cambria	69,904	90,316	Lake Superior	219,673	174,959	Negaunee	446,318	140,406	Volunteer	9,008	51,240
Cleve. Cliffs Group	1,004,684	344,950	Lillie	109,548	844	Princeton (Swanzey)	162,138	27,962	Washington	66,749	62,592
Empire	32,933	17,117	Lloyd	44,467	28,003	Queen Group	351,916	297,675			
			Lucy (McComber)	73,120	16,677	Republic	156,864	113,012			
			Maas	46,249	24,927	Richmond	118,554	47,586	Total	4,202,308	2,833,116

GOGEBIC RANGE

	1912.	1911.		1912.	1911.		1912.	1911.		1912.	1911.
Anvil	54,504	310	Colby	245,195	41,630	Newport	966,357	560,760	Puritan	90,683	.....
Ashland	211,927	151,478	Eureka	65,716	98,609	Norrie Group	1,500,732	883,910	Sunday Lake	155,485	56,096
Asteroid	70,240	20,570	Harmony (Germania)	27,950	.....	Ottawa (Odanah)	111,396	44,643	Tilden	158,151	138,387
Atlantic	142,080	.....	Iron Belt	2,808	.....	Palms	39,168	.....	Yale (West Colby)	76,772	154,944
Brotherton	148,930	65,015	Ironton	173,135	63,359	Pence	14,924	26,870			
Cary	308,292	120,017	Montreal	247,772	153,122	Plumer	47,578	.....	Total	4,996,498	2,603,318
Castile	136,703	23,598									

CUYUNA RANGE

	1912.	1911.		1912.	1911.
Armour No. 1	49,539	.....	Thompson	9,888	.....
Armour No. 2	49,031	.....			
Kennedy	196,653	147,431	Total	305,111	147,431

VERMILLION RANGE

	1912.	1911.		1912.	1911.
Chandler	73,370	50,206	Soudan	88,714	65,349
Pioneer	647,237	400,919	White Iron	30	.....
Savoy	90,528	87,964	Zenith	478,682	448,295
Section 30	157,344	34,298			
Sibley	309,076	1,899	Total	1,844,981	1,088,930

MISCELLANEOUS IN WISCONSIN

	1912.	1911.		1912.	1911.
Iron Ridge	19,284	17,002			
Mayville	84,747	98,627	Total	104,031	115,629

	1912.	1911.
GRAND TOTAL	48,211,778	32,793,130

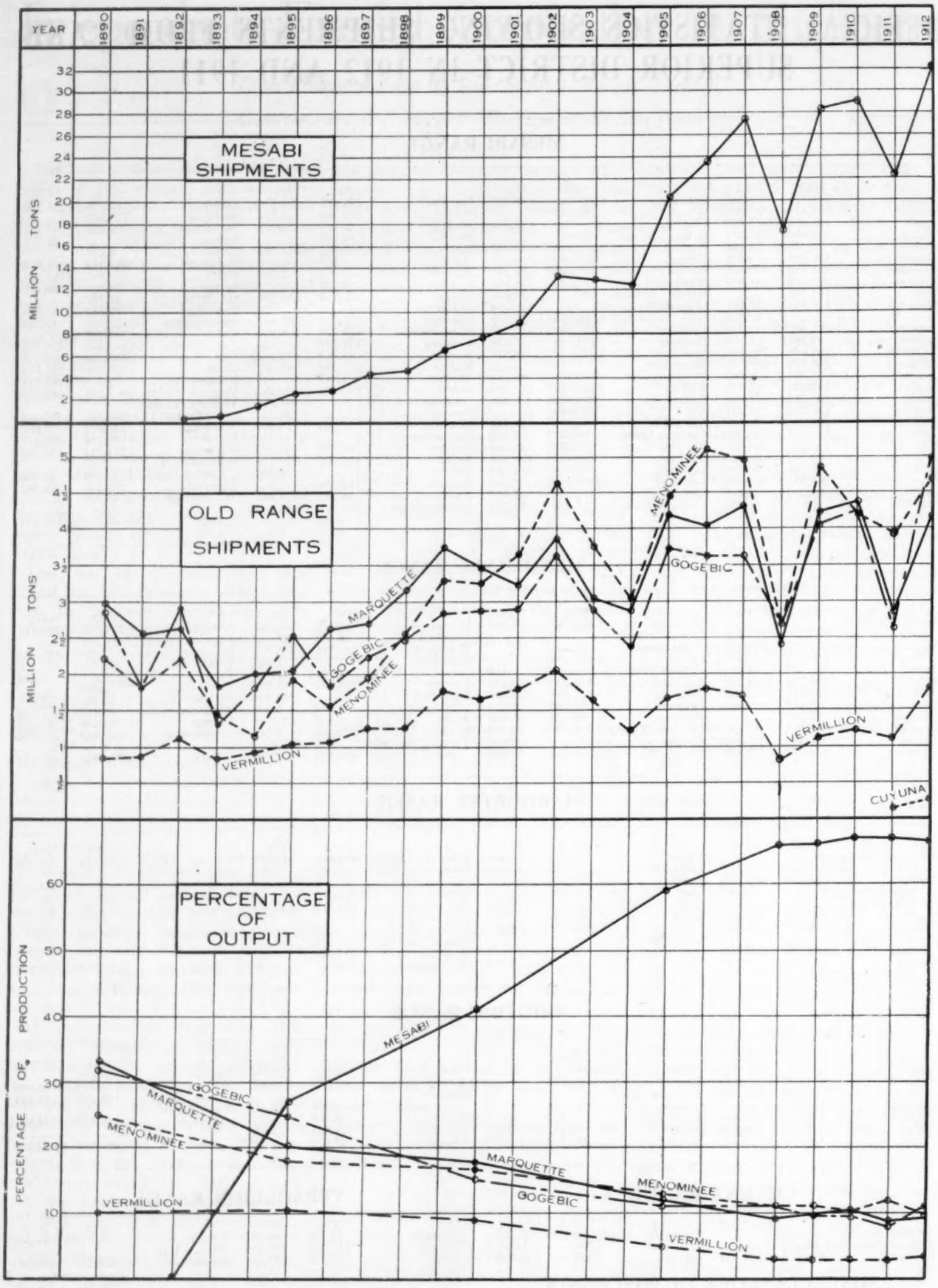


CHART SHOWING PRODUCTION OF MESABI, 1892-1912; OLD RANGES, 1890-1912; PERCENTAGE OF PRODUCTION BY FIVE YEAR PERIODS, 1890-1905, AND YEARLY 1908 TO 1913

the lead of all other mines, shipping 2,232,112 tons in 1912, the Leonard being second with 2,198,119 tons and the Canisteo third with 2,099,880 tons. The Hill, which was the leading mine in 1911 with 1,550,568 tons, shipped 1,188,908 tons last year. The Mahoning continued its steady record, shipping 1,518,643 tons.

The following new properties shipped:

On the Mesabi: Grace, from which shipments were made by the Inland Steel Co.; Madrid and Section 17, Euclid Mining Co.; Morton, of Tod, Stambaugh & Co.; Woodbridge, of Oglebay, Norton & Co.

On the Gogebic: Plumer, Oliver Iron Mining Co.

On the Menominee: Cortland and Virgil, Wickwire Steel Co.; Ravenna, M. A. Hanna & Co.

On the Marquette: Morris, Cleveland-Cliffs Iron Co.

On the Cuyuna: Armour No. 1 and Armour No. 2, Rogers, Brown Ore Co.; Thompson, Inland Steel Co.

In addition, a small shipment for test purposes was made from the White Iron mine, Vermillion range, owned by the White Iron Lake Iron Co.

Exclusive of this property, there were 13 new shippers in 1912, compared with 12 new mines opened in 1911. In 1910, there were 16. Of the 13 opened last year, the Mesabi had five, the Menominee and Cuyuna three each, and the Marquette and Gogebic one each. Shipments from new mines in 1912 totaled 361,904 tons; in 1911, 1,769,423 tons; in 1910, 1,734,044 tons.

Three mines, idle for years, shipped again last season. They were the Scranton and St. Paul on the Mesabi, idle since 1904 and 1907, respectively, and the Palms, on the Gogebic, which shipped last in 1906.

Shipments from Canadian mines were as follows: Helen, of the Lake Superior Corporation, 48,838 tons; Moose Mountain of Oglebay, Norton & Co., 39,061 tons. The Helen shipped 128,628 in 1911 and 115,790 tons in 1910. The Moose Mountain shipped 6,678 tons in 1911 and 72,470 tons in 1910. These figures are not included in our figures for Lake Superior ore shipments.

There were 194 shippers in 1912, compared with 184 in 1911, 196 in 1910, and 172 in 1909. Of these, the Mesabi had 92, Menominee 37, Marquette 28, Gogebic 23, Vermillion eight, Cuyuna four and the Wisconsin fields two. The figures for 1911 were: Mesabi, 90; Menominee, 38; Marquette, 29; Gogebic, 17; Vermillion, seven; Cuyuna, one; Wisconsin fields, two.

There were 21 mines which shipped in 1911 and were idle in 1912. The list is as follows:

On the Mesabi: Burt, Glen, Hector (Hale), Higgins, Leonard-Burt, Mariska, Minnewas, Onandaga, Pearce, Penobscot, Platt, Sellers, Victoria.

On the Menominee: Antoine (Clifford), Baker, Gibson, Hollister, Mansfield, Tully.

On the Marquette: Beaufort (Ohio), Gwynn.

The following table shows the average production of the mines on the five leading ranges and of the district for 1912 and 1911, the small shipment from the White Iron mine, Vermillion range, not being included:

	Average mine production, Gross tons. 1912.	1911.
Mesabi	348,341	245,484
Vermillion	263,564	155,561
Gogebic	217,239	153,136
Marquette	150,082	97,694
Menominee	127,336	102,926
Lake Sup'r dist.	249,802	178,223

SHIPMENTS BY RANGES, GROSS TONS.

	1912.	1911.	1910.	1909.	1908.	1907.
Marquette	4,202,308	2,833,116	4,392,726	4,256,172	2,414,632	4,388,073
Menominee	4,711,440	3,911,174	4,237,738	4,875,385	2,679,156	4,964,728
Gogebic	4,996,498	2,603,318	4,315,314	4,088,037	2,699,856	3,637,102
Vermillion	1,844,981	1,088,930	1,203,177	1,108,215	841,544	1,685,267
Mesabi	32,047,409	22,093,532	29,201,760	28,176,281	17,257,350	27,495,708
Cuyuna	305,111	147,431	.....	.....	.....	.....
Miscellaneous	104,031	115,629	91,682	82,759	122,449	95,790
Total	48,211,778	32,793,130	43,442,397	42,586,869	26,014,987	42,266,668

SHIPMENTS BY PORTS AND ALL-RAIL, GROSS TONS.

	1912.	1911.	1910.	1909.	1908.	1907.
Escanaba	5,234,655	4,278,445	4,959,726	5,747,801	3,351,502	5,761,988
Marquette	3,296,761	2,200,380	3,248,516	2,909,451	1,487,487	3,013,826
Ashland	4,797,101	2,429,290	4,094,374	3,834,207	2,513,670	3,436,867
Two Harbors	9,370,969	6,367,537	8,271,177	9,181,132	5,702,237	8,188,906
Superior	14,240,714	9,920,490	8,414,799	6,540,505	3,564,030	7,440,386
Duluth	10,495,577	6,934,269	13,640,166	13,470,503	8,808,168	13,448,736
Total by lake	47,435,777	32,130,411	42,628,758	41,683,599	25,427,094	41,290,709
Total by rail	776,001	662,719	813,639	903,270	587,893	975,959
Total	48,211,778	32,793,130	43,442,397	42,586,869	26,014,987	42,266,668

HANNA ORES

Include Ore From the Cuyuna—Tables For Figuring Values.

The annual iron ore booklet of M. A. Hanna & Co., for 1913, has as a frontispiece a halftone engraving of the *Leader-News* building, now nearly completed, in which the offices of the firm will be located after April 1. The firm this year for the first time offers for sale an ore from the Cuyuna range. It is the Barrows, and the expected analysis for the season of 1913 is iron, 49.28 per cent natural; phosphorus, 0.435, and silica, 7.88. Other ores not heretofore sold by M. A. Hanna & Co., are: The Ravenna, a non-Bessemer, on the Menominee range; Helmer No. 1 and Helmer No. 2, Mesabi non-Bessemers, and magnetic concentrates from the mines of the Canada Iron Mines, Ltd., in Hastings county, Ont. This last ore is coarse, granular and contains a small amount of fines. The booklet contains tables for figuring values of Lake Superior iron ores, which are reproduced on this page.

TABLE FOR FIGURING VALUES OF LAKE SUPERIOR IRON ORES AT LOWER LAKE PORTS, 1913

OLD RANGE BESSEMER ORES.

Base Price $4.40 at Lake Erie Ports. Guarantee 55 Per Cent Iron Natural. Guarantee 0.045 Per Cent Phosphorus Dried at 212 Degrees Fahr.

Iron natural, per cent.	Unit value, per cent.		
For 61.00	60—61	0.09091	$5.10
For 60.00	59—60	0.14091	5.00
For 59.00	58—59	0.13091	4.86
For 58.00	57—58	0.12091	4.73
For 57.00	56—57	0.11091	4.61
For 56.00	55—56	0.10091	4.50
For 55.00, base ore		0.09091	4.40
For 54.00	54—55	0.09091	4.31
For 53.00	53—54	0.09091	4.22
For 52.00	52—53	0.09091	4.13
For 51.00	51—52	0.09091	4.04
For 50.00	50—51	0.09091	3.95
For 49.00	49—50	0.13637	3.81
	48—49	0.18182	
	Below 48	0.18182	

MESABI RANGE BESSEMER ORES.

Base Price $4.15 at Lake Erie Ports. Guarantee 55 Per Cent, Iron Natural. Guarantee 0.045 Per Cent Phosphorus Dried at 212 Degrees Fahr.

Iron natural, per cent.	Unit value, per cent.		
For 58.00	57—58	0.11636	$4.47
For 57.00	56—57	0.10636	4.35
For 56.00	55—56	0.09636	4.25
For 55.00, base ore		0.08636	4.15
For 54.00	54—55	0.08636	4.06
For 53.00	53—54	0.08636	3.98
For 52.00	52—53	0.08636	3.89
For 51.00	51—52	0.08636	3.80
For 50.00	50—51	0.08636	3.72
For 49.00	49—50	0.12954	3.59
For 48.00	48—49	0.17272	3.42
	Below 48	0.17272	

OLD RANGE NON-BESSEMER ORES.

Base Price, $3.60 at Lake Erie Ports. Guarantee 51.50 Per Cent Iron Natural.

Iron natural, per cent.	Unit value, per cent.		
For 61.00	60—61	0.08155	$4.37
For 60.00	59—60	0.08155	4.29
For 59.00	58—59	0.08155	4.21
For 58.00	57—58	0.08155	4.13
For 57.00	56—57	0.08155	4.05
For 56.00	55—56	0.08155	3.97
For 55.00	54—55	0.08155	3.89
For 54.00	53—54	0.08155	3.80
For 53.00	52—53	0.08155	3.72
For 52.00	51.50—52	0.08155	3.64
For 51.50, base ore		0.08155	3.60
For 51.00	51—51.50	0.08155	3.56
For 50.00	50—51	0.08155	3.48
For 49.00	49—50	0.12232	3.36
For 48.00	48—49	0.16310	3.19
	Below 48	0.16310	

MESABA RANGE NON-BESSEMER ORES.

Base Price, $3.40 at Lake Erie Ports. Guarantee 51.50 Per Cent Iron Natural.

Iron natural, per cent.	Unit value, per cent.		
For 54.00	53—54	0.07767	$3.60
For 53.00	52—53	0.07767	3.52
For 52.00	51.50—52	0.07767	3.44
For 51.50, base ore		0.07767	3.40
For 51.00	51—51.50	0.07767	3.36
For 50.00	50—51	0.07767	3.28
For 49.00	49—50	0.11650	3.17
For 48.00	48—49	0.15534	3.01
	Below 48	0.15534	

RECORD YEAR

For Production of Open Hearth Rails —Nearly Double That of Bessemer.

The bureau of statistics of the American Iron and Steel Institute has received from the manufacturers complete statistics of the production of all kinds of rails in the United States in 1912. For 1911 and all previous years, the statistics given below were compiled by the American Iron and Steel Association.

The production of all kinds of rails in the United States in 1912 amounted to 3,327,915 tons, against 2,822,790 tons in 1911, an increase of 505,125 tons, or over 17.8 per cent. Included in the total for 1912 are 174,004 tons of girder and high T steel rails for electric and street railways, as compared with an output of 205,409 tons of similar rails in 1911.

Of the total production of rails in 1912, 3,165,939 tons were rolled from Bessemer, open-hearth and electric steel blooms or billets; 42,585 tons were rolled from new seconds, defective new rails and steel crop ends; and 119,390 tons were re-rolled from old steel rails or were renewed steel rails. No iron rails are reported for 1912. In the accompanying table, the production of all kinds of rails in 1912 is given by states in gross tons.

Included in the 122,845 tons of rails rolled in 1912 and classified as electric and rerolled steel are 3,455 tons of rails rolled from electric steel and 119,390 tons of renewed rails or rails rolled from old steel rails which the makers were unable to classify as Bessemer or open-hearth. Twenty-four works in 12 states rolled or re-rolled rails in 1912, against 25 works in 11 states in 1911. The production of all kinds of rails by states is given in the accompanying table from 1909 to 1912 in gross tons.

Bessemer Steel Rails

The production of Bessemer steel rails in 1912 amounted to 1,099,926 tons, against 1,053,420 tons in 1911, an increase of 46,506 tons. Of this total in 1912, 1,070,480 tons were rolled from ingots and 29,446 tons were rolled from new seconds, defective new rails, crop ends, etc. Illinois was the largest maker of Bessemer rails in 1908, 1909, 1910, 1911 and 1912, but Pennsylvania was the largest maker in 1907. The maximum production of Bessemer rails was reached in 1905, when 3,791,459 tons were produced. The year of next largest production was 1907, when the output was 3,380,025 tons. The accompanying table gives the production of Bessemer rails by states in gross tons from 1907 to 1912.

Open-Hearth Steel Rails

The production of open-hearth steel rails in 1912 amounted to 2,105,144 tons, against 1,676,923 tons in 1911, an increase of 428,221 tons, or over 25.5 per cent. Of the total in 1912 2,092,004 tons were rolled from ingots and 13,140 tons were rolled from new seconds, defective new rails, crop ends, etc. Almost all were rolled from basic steel. The maximum production was reached in 1912. The year of next largest production was 1910. The table gives the production by states since 1907.

It will be noticed that the production of open-hearth rails in 1912 was almost twice that of Bessemer rails in the same year.

Electric Steel Rails

In 1912 the production of rails rolled from steel made in electric furnaces amounted to 3,455 tons, as compared with 462 tons in 1911. In 1909 and 1910 small quantities of rails were

PRODUCTION OF OPEN-HEARTH STEEL RAILS.

States—Gross tons.	1907	1908.	1909.	1910.	1911.	1912.
N. Y., N J., and Pa.	37,023	184,059	335,856	445,139	579,924	712,056
Md., Ga., Ala., & Ohio.	152,163	251,956	344,842	570,878	509,950	600,113
Ind., Ill., Wis., Col., and California	63,518	135,776	575,976	735,342	587,049	792,975
Total	252,704	571,791	1,256,674	1,751,359	1,676,923	2,105,144

PRODUCTION OF ALL KINDS OF RAILS BY STATES

States—Gross tons. All kinds of rails.	1909.	1910.	1911.	1912.
New York, New Jersey, and Md.	621,373	711,975	490,980	585,817
Pennsylvania	655,707	986,702	839,663	888,672
West Virginia, Alabama, and Ohio	367,039	496,716	447,905	622,121
Ind., Ill., Wis., Col., Wash., and Cal.	1,179,726	1,440,638	1,044,242	1,231,305
Total	3,023,845	3,636,031	2,822,790	3,327,915

PRODUCTION OF ALLOY STEEL RAILS.

Alloy rails—Gross tons.	Bessemer.	Open-hearth and electric.	Total.
Titanium steel rails	103,941	37,832	141,773
Manganese, copper, and nickel	4,933	2,561	7,494
Total for 1912	108,874	40,393	149,267
Total for 1911	115,450	38,539	153,989
Total for 1910	229,935	27,389	257,324
Total for 1909	35,699	13,696	49,395

PRODUCTION OF BESSEMER STEEL RAILS.

States.	1907.	1908.	1909.	1910.	1911.	1912.
N.Y.,N.J.&Md.	1,054,480	386,730	586,193	568,353	284,230	367,128
Pennsylvania	1,093,932	315,547	553,719	591,473	352,331	343,837
West Va., Ga., Ala., Ohio, Ind., and Ill.	978,685	576,040	627,259	724,616	416,859	388,961
Wis., Col., Cal., and Wash.	252,928	70,836				
Total	3,380,025	1,349,153	1,767,171	1,884,442	1,053,420	1,099,926

PRODUCTION OF ALL KINDS OF RAILS.

States—Gross tons. All kinds of rails.	Bessemer rails.	Open-hearth rails.	Electric, re-rolled steel, and iron.	Total. Gross tons.
New York, New Jersey, and Md.	367,128	188,122	30,567	585,817
Pennsylvania	343,837	526,755	18,080	888,672
West Virginia, Alabama, and Ohio.	93	597,292	24,736	622,121
Indiana, Ill., Wis., Col., and Wash.	388,868	792,975	49,462	1,231,305
Total for 1912	1,099,926	2,105,144	122,845	3,327,915
Total for 1911	1,053,420	1,676,923	92,447	2,822,790

PRODUCTION OF RAILS FOR 16 YEARS

Years—Gross tons.	Bessemer.	Open-hearth.	*Iron and all other.	Total.
1897	1,644,520	500	2,872	1,647,892
1898	1,976,702	1,220	3,319	1,981,241
1899	2,270,585	523	1,592	2,272,700
1900	2,383,654	1,333	695	2,385,682
1901	2,870,816	2,093	1,730	2,874,639
1902	2,935,392	6,029	6,512	2,947,933
1903	2,946,756	45,054	667	2,992,477
1904	2,137,957	145,883	871	2,284,711
1905	3,192,347	183,264	318	3,375,929
1906	3,791,459	186,413	15	3,977,887
1907	3,380,025	252,704	925	3,633,654
1908	1,349,153	571,791	71	1,921,015
1909	1,767,171	1,256,674	.....	3,023,845
1910	1,884,442	1,751,359	230	3,636,031
1911	1,053,420	1,676,923	†92,447	2,822,790
1912	1,099,926	2,105,144	†122,845	3,327,915

*Iron rails only from 1897 to 1910 inclusive. †Include 234 tons of iron rails in 1911 but none in 1912; also 462 tons in 1911 and 3,455 tons in 1912 of rails rolled from electric steel; also 91,751 tons in 1911 and 119,390 tons in 1912 of renewed rails or rails rerolled from old steel rails which the manufacturers could not classify as Bessemer or open-heath steel rails.

also rolled from electric steel, but these rails were included with the Bessemer and open-hearth rails reported for these years.

Rerolled and Renewed Rails

In 1912 the production of steel rails rolled from new seconds, defective new rails, crop ends, old steel rails, etc., including renewed rails, amounted to 161,976 tons, of which 42,586 tons were rolled from new seconds, etc., and 119,390 tons were renewed rails or were rerolled from old steel rails. Of the 42,586 tons rolled from new seconds, etc., 29,446 tons were rolled from Bessemer steel and 13,140 tons were rolled from open-hearth steel, and are therefore included in the totals given for Bessemer and open-hearth rails for that year. But, as the 119,390 tons of rails rolled from old steel rails in 1912, and the renewed rails as well, could not be classified by the manufacturers, they are not included in the Bessemer or open-hearth rail output for that year, but are grouped under the general heading of electric and rerolled steel rails. Prior to 1911 all rails of this class are included with Bessemer or open-hearth steel rails.

Iron Rails

No iron rails were rolled in 1912. In 1911 the production was 234 tons, all rolled in Illinois, and all weighing less than 45 pounds to the yard, against 230 tons in 1910.

The production in 1912 of rails weighing under 45 pounds to the yard shows an increase of 29,914 tons as compared with 1911; rails weighing 45 pounds and less than 85 pounds show an increase of 50,896 tons; and rails weighing 85 pounds and over show an increase of 424,315 tons. In 1912 over 41 per cent of the rails weighing less than 45 pounds to the yard, nearly 53 per cent of the rails weighing 45 pounds and less than 85 pounds, and over 20 per cent of the rails weighing over 85 pounds were rolled from Bessemer steel, while in the same year over 30 per cent of the rails weighing less than 45 pounds per yard, over 42 per cent of the rails weighing 45 pounds and less than 85 pounds, and over 78 per cent of the rails weighing 85 pounds and over were rolled from open-hearth steel.

Rails by Processes

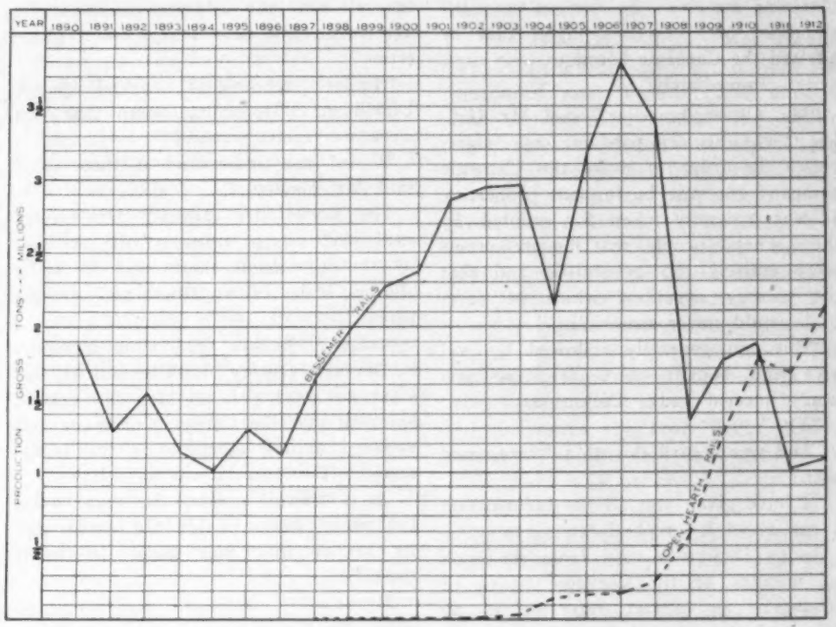
In the accompanying table, the production of all kinds of rails from 1897 to 1912 is given by processes in gross tons of 2,240 pounds. Of the total production of rails in 1912, about 33.05 per cent were rolled from Bessemer steel, about 63.25 per cent were rolled from acid and basic open-hearth steel, and about 3.70 per cent were rolled from electric steel and from old steel rails.

Included in the 3,327,915 tons of rails rolled in 1912 are 149,267 tons of alloy rails, against 153,989 tons in 1911. The accompanying table gives the production of titanium, manganese, and other alloy steel rails by processes from 1909 to 1912.

Imports and Exports

In addition to the rails rolled in 1912, the United States imported 3,780 tons of iron and steel rails. During the same year the exports were 446,473 tons of steel rails. In 1911 the exports of rails, all steel, amounted to 420,874 tons and the imports to 3,414 tons.

The annual consumption of rails in the United States is approximately ascertained by adding the quantity imported to the total production and deducting the quantity exported. The consumption for the past three years has been as follows: 1910, 3,290,712 tons; 1911, 2,405,330; 1912, 2,885,222 tons.



PRODUCTION OF RAILS SHOWN GRAPHICALLY

Will Sink Shaft

The Dominion Iron & Steel Co. will sink a trial shaft at Glencoe, Inverness county, Nova Scotia, on its iron ore property opened there some time ago. Tests made of the ore show it to be of good quality. The trial shaft sunk will be about 10 x 12 and 300 feet deep. The company now imports large quantities of foreign ore.

GAYLEY TESTIFIES

About Lake Superior Ore Purchases At Hearing.

James Gayley, first vice president of the United States Steel Corporation, from the time it was organized until Jan. 1, 1909, was called to the witness stand last Friday to give testimony for the government in its suit, asking the dissolution of the Steel Corporation. His examination was devoted mainly to a discussion of conditions which obtained in the Lake Superior iron ore district prior to 1901. During the years 1895 to 1901, said Mr. Gayley, his activities were confined chiefly to that district, he having been a director and officer of the Carnegie Steel Co.'s subsidiary, the Oliver Mining Co., which, in 1896, became the Oliver Iron Mining Co. During those years he was also well informed as to the policies of the Carnegie Steel Co., since he attended the meetings of the board of managers as an alternate for H. M. Curry.

Judge J. M. Dickinson, of government counsel, questioned Mr. Gayley regarding the methods which were followed by the Carnegie Steel Co. in acquiring new bodies of ore in the Lake Superior district. The attorney endeavored to show that one of its objects in buying ore lands was to keep them from passing into the possession of other companies, and particularly the Minnesota Iron Co., which was owned by its competitor, the Federal Steel Co.

"Is it not a fact," asked Judge Dickinson, "that competition for ore properties was very sharp prior to the

formation of the Steel Corporation?"

"It is," replied Mr. Gayley.

Among the interests which owned and were acquiring ore land in the Lake Superior district about that time, he mentioned the Hill and the Gates interests, the Rockefeller interests, Corrigan, McKinney & Co., Pickands, Mather & Co., and others. Mr. Gayley mentioned an agreement which had been entered into by the Lake Superior Consolidated Iron Mines and the Minnesota Iron Co., whereby these two companies, having both acquired large holdings of ore, were non-competitive. This agreement, however, according to a report by Henry W. Oliver at the time, had a deeper significance, for Mr. Oliver advised the board of managers of the Carnegie company that the Minnesota Iron Co. was trying to buy from the Lake Superior company the mines from which the Carnegie company was obtaining its ore. So serious was the situation, Mr. Oliver thought, that he advised the Carnegie board to take some action immediately.

"Mr. Oliver, however," said Mr. Gayley, "was always parading up 'scare-crows' in order to make the Carnegie company continue buying ore properties. It was generally taken for granted, by the Carnegie people, that his predictions were entirely too pessimistic and that the gloomy situations which he foretold would never materialize."

"But you generally followed his advice and bought more ore, did you not?" queried Judge Dickinson.

"Yes."

"Did you regard this as a 'scare-crow' then?"

"I have given you all the information I can about it," replied Mr. Gayley.

Judge Dickinson read from the book of minutes of the Carnegie board of managers an extract referring to an effort on the part of Rev. F. T. Gates, representative of the Rockefeller ore interests, to have the Carnegie company enter into an agreement relating to the sale of ore. This, however, the Carnegie company refused to do, as it believed that, owing to the "joint arrangement" existing between the Federal Steel Co.'s ore interests and the Rockefeller interests, the Carnegie company, by entering into the agreement proposed by Reverend Gates, would no longer hold the balance of power. Mr. Gayley was quoted in the minutes as saying:

"We will be at the mercy of the joint arrangement."

Judge Dickinson next turned his attention to an agreement effected at ananother time between the Carnegie Steel Co. and the Lake Superior Consolidated Iron Mines, in 1899.

"Did F. T. Gates demand that the Oliver Iron Mining Co. or the Carnegie Steel Co. turn over 75,000,000 tons of ore which he claimed had been secured in contravention of an agreement between the Lake Superior Consolidated and the Oliver companies?" asked the attorney.

"Yes," said Mr. Gayley. "The Oliver company had made an agreement not to secure properties on the range providing that the Rockefeller interests supplied us with the ore we needed. These two properties were secured because the Rockefeller interests would not sell us ore properties. Mr. Gates' view was that they were selling us all we needed."

"What was the result of this difference?"

"We turned over the two properties to Gates on the understanding that they would lease to us not only the same two properties on the same terms as before, with the addition of a traffic agreement, but also many other properties."

"Traffic agreement?" asked Judge Dickinson. "Does that mean that you were to receive rebates?"

"I did not understand it that way," said Mr. Gayley.

The Rockefeller railroad, Mr. Gayley explained, was to transport the ore and by the agreement there was to be a sliding scale of royalties and freight rates.

Judge Dickinson read from a report by Messrs. Gayley and Clemson in the Carnegie book of minutes an extract showing that the Carnegie company felt satisfied at the outcome of the transaction. The extract was as follows:

"It is difficult to play the game when the other fellow holds the cards and he knows that you know he holds them."

Mr. Gayley was still on the stand when the hearing adjourned. A postponement was agreed upon until Wednesday, in order that Judge Dickinson might attend the inauguration ceremonies in Washington on Tuesday. Mr. Gayley's examination promises to be as long-drawn-out as that of Wm. E. Corey.

Denies Report

Pittsburgh, March 4.—Reports to the effect that the Standard Steel Car Co., with headquarters in Pittsburgh, expects to build a plant at the head of the great lakes, have been officially denied. It is understood that property owners have attempted to interest the Standard company, but absolutely nothing has been done toward building a plant in that section of the country, according to authoritative statements made here.

BRITISH IRON TRADE

Slump in Cleveland Warrants Affects Other Lines.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Feb. 22.

Birmingham, Eng., Feb. 22.—The feature of the week has been the sensational slump in the price of Cleveland pig iron. In three or four days the prices of Cleveland warrants came down about 5s. The principal cause was the panic of speculators, stimulated by the unfavorable condition of international politics. The cash price, early in the week, fell by 3s 9d, and the three months rate by 4s 8d.

The natural effect was to shut off business almost completely, and to some extent, makers were unable to resist the depressing influence of the warrant slump. A recovery has, however, now set in, and yesterday, the selling price was 62s ($15.18) until the end of the day, when there was a fall of 9d from the opening of the market. Sellers have, of course, done all they could to discount these speculative movements, but they have not been altogether successful. There is a great deal of uncertainty at present and all buying is strictly for immediate requirements. The fairly healthy state of demand is shown by the shipments which steadily reduce. Stocks are at present 225,000 tons, as compared with 234,000 at the beginning of the month. Smelters profess themselves fairly confident as to the future, as very few large contracts have been entered into for a long time, and they believe a buying movement must set in shortly. The firmness of sellers is no less remarkable than the slump in warrants. At present the consumption of pig iron is fairly high, although not quite as high as it was.

Although the works continue generally active, and Sheffield in particular is extremely busy, makers of finished iron are not at all comfortable in regard to the general position. The effect of the war is being felt severely; the fall in copper has a bad influence, and the signs of increasing labor unrest have greatly disturbed the public mind. Generally speaking, the finished iron trade is quiet in all branches and anybody with a good contract to offer could get prices shaded. In galvanized sheets the downward movement has gained impetus, so that it is now possible to buy galvanized sheets at as low as £11 5s, although some makers still quote £12.

MINING NEWS FROM THE IRON RANGES

Cuyuna Range Activity

Two new stripping propositions are being talked of on the Cuyuna range. One is located in section 17, township 46, range 29, near the Carlson-Williams hydraulic works. The other is located at the Inland Steel Co.'s Thompson mine at Crosby, where exploration work has disclosed a shallow body of ore which may be easily stripped, thus effecting a great saving in timber, pillars and expense of operation.

The Cuyuna-Duluth mine at Ironton has attained depth of 120 feet. It will be necessary to go 80 feet further before cross-cutting can be commenced and 200 feet of drifting will be required before the ore body is reached. It is expected to hoist the first ore on June 1.

The Duluth-Brainerd Mining Co. has recently secured an option for a lease in section 32, township 47, range 29, and a drill has been started on the mine by the Helmar Exploration Co. Another drill is working on section 23, township 133, range 29. All three drills of the Stowell Exploration Co. are operating in sections 4, 8, and 9, township 45, range 28. This is the so-called Bay Lake district. C. W. Potts, of Deerwood, has a drill at Farm Island Lake, east of Bay Lake, in Aitkin county. Mr. Potts also has a drill in section 9, township 49, range 29.

Construction crews are working on the Soo Line extension to the property of the Iron Mountain Mining Co., near Crosby. It is expected that three new shafts will be sunk in this vicinity this season. One will be three-quarters of a mile south of the Iron Mountain property, another near the Flynn property and the third north of the Iron Mountain property near Manganese.

At the present time, the Rogers-Brown Ore Co. is hoisting between 1,200 to 1,500 tons of ore daily from its Armour No. 1 and No. 2 shafts, and about 700 tons from the Kennedy mine. At the latter, the air and timber shaft located about 1,000 feet from the present working shaft has been completed. This shaft is down about 200 feet and connects with various levels giving the underground workings excellent ventilation.

Considerable drilling is being done west of the town of Cuyuna. One outfit is operating on the ore extension west of the Kennedy mine. At the Adams mine on the south range, southwest of Deerwood and near Oreland, the boilers have been installed and a steam line is being laid to the shaft. Concrete is being laid for the foundations for machinery at this mine. Two steam shovels are at work in the Pennington pit north of Crosby and Ironton.

Labor Stringency

Prominent Austrian and Italian citizens of Hibbing, Minn., Mesabi range, predict that the opening of the spring shipping season will witness the most pronounced labor shortage ever evidenced on the iron ranges.

In the case of the Austrian people, a recent government edict is cited to the effect that no male citizen of Austria between the ages of 18 to 40 years will be allowed to leave any of the ports on the Mediterranean during the summer of 1913, or until the edict is removed. The war situation is held responsible.

In Italy, the Italian newspapers are attacking recent legislation undertaken in Minnesota and elsewhere in the United States affecting the rights of aliens. Minnesota's proposed workmen's compensation act is severely grilled and many influential Italian newspapers are calling on the government to take steps to prevent Italian subjects from coming to America.

Advices from both Italy and Austria are that few laborers left those countries during February for points on the iron ranges. Usually at this season of the year, this business is heavy. So far as the immediate situation on the ranges is concerned, there is no change. Labor has been in demand since late in the summer of 1912. Small contractors pay as high as $2.50 a day for common labor and even then have difficulty in securing a sufficient number of men.

Open Pit on Cuyuna

With two steam shovels in service, excellent progress is being made with the work of stripping Tod, Stambaugh & Co.'s new Pennington mine, west of Crosby, on the Cuyuna range. A force of 200 men is employed. The Pennington will be the first open pit property developed in this new mining district of Minnesota.

Exploring of Vermillion Range

The Gleason Exploration Co., which owns valuable mines at Iron River, Menominee range, has secured an option on promising mineral lands between the Chandler mine and Long Lake, near Ely, Minn., and exploratory work is to be started at once.

The principal stockholders of the Gleason company are Michael Gleason, of Gladstone, formerly of Republic, and his son, Matthew Gleason, of San Diego, Cal., M. J. Murphy, of Ely, and H. E. Good, of Winton, Minn.

The Gleason company did not find any high grade ore on the tract they explored near Palmer, and gave up the option after conducting drilling operations there for less than a year. The company is now receiving a royalty from its properties in the Iron River district. The New York State Steel Co., of which Rudolph Erickson, formerly chief engineer of the Pittsburgh & Lake Angeline Iron Co., is superintendent, has control of the mines on the Gleason lands. Two properties have been opened up, and they are now among the heaviest producers in the Iron River district, in spite of the fact that ground for the shaft was broken less than four years ago.

It is said that the Gleason company will likely strike ore in its new holdings on the Vermillion range. Test pits will be sunk to the formation, which is near surface, and drills will be put in operation. In places the ore outcrops on surface, and the samples analyzed have shown satisfactory results. It is thought that a property will be opened that will be a producer of high grade ore.

Stripping at Hawkins Mine

It is expected that stripping operations at the Hawkins mine, at Nashwauk, on the Mesabi range will be resumed shortly. This is one of the large properties in Minnesota and is operated by the International Harvester Co. through its subsidiary, the Wisconsin Steel Co. Stripping will also soon be resumed at the Bennett mine, near Nashwauk. Both the Hawkins and Bennett will ship heavily during the coming year.

FINISHED PRODUCTS

Make Rapid Increase in Exports.—Imports Continue to Decline.

The completed official returns for the year show that iron and steel exports in the tonnage lines amounted to 2,948,466 gross tons, closely conforming to the forecast made when the November returns were given, but falling some 30,000 tons short of the forecast based on returns through October. Iron and steel exports in calendar years have been as shown in the accompanying table, including scrap, pig iron, finished and unfinished rolled iron and steel. Various items have been added to the category from time to time, the latest additions being pipes and fittings since July 1, 1905, cast radiators and house heating boilers since July 1, 1910, and railroad spikes, bolts, nuts, rivets, washers and horseshoes since July 1, 1912.

IRON AND STEEL EXPORTS, GROSS TONS.

	December,		Twelve months, ending December,	
	1911.	1912.	1911.	1912.
Scrap	3,989	9,326	77,918	105,508
Pig iron	10,941	24,011	120,799	272,676
Billets, sheet bars, etc.	17,435	22,454	234,267	295,818
Wire rods	3,925	6,984	22,641	65,023
Rails	22,874	35,279	420,874	446,473
Steel bars	11,397	16,350	123,349	208,213
Iron bars	1,015	2,234	17,683	21,926
Structural	17,728	25,215	223,493	288,164
Hoop, band and scroll	799	1,388	3,731*	12,557
Sh'ts & plates	43,861	43,664	372,372	546,967
Tin plates	6,652	4,534	61,381	81,694
Barbed wire	8,013	6,769	96,754	96,059
All oth. wire	14,431	10,676	133,008	148,653
Cut nails	946	540	11,422	9,311
Wire nails	9,048	4,281	53,614	68,319
All other, including tacks	448	377	12,848	8,198
Pipes and fittings	1,670	18,330	197,507	249,856
Railroad spikes	†	1,160	†	†6,669
Bolts, nuts, rivets, washers	†	1,590	†	†9,960
Horse shoes	†	102	†	†510
Cast radiators	385	640	4,063	5,912
Totals	190,854	235,931	2,187,724	2,948,466

*Not stated prior to July 1, 1911.
†Not stated prior to July 1, 1912.

The heavy export movement which culminated in 1900 was very largely in pig iron and billets and sheet bars, except that rails and wire products figured largely. The next movement, which started in 1904, was based more largely upon finished steel products. This fact is brought out by a specific comparison between 1901 and 1912. The total increased from 1,154,284 tons to 2,948,466 tons, or 156 per cent, whereas pig iron actually decreased, from 286,687 tons to 272,676 tons, or 5 per cent, while rails increased only from 356,245 tons to 446,473 tons, or 25 per cent. With an actual decrease in pig iron and an increase in rails equal to only one-sixth the increase in the total, it can be seen that the increase in exports has run very largely to the more finished products.

IRON AND STEEL IMPORTS, GROSS TONS.

	December,		Twelve months, end'g December,	
	1911.	1912.	1911.	1912.
Scrap	650	2,712	17,272	23,612
Pig iron	13,795	12,032	148,459	129,325
Blooms, billets, steel n. e. s.	1,072	1,696	29,205	18,702
Wire rods	1,146	1,331	15,483	15,069
Rails	335	195	1,005*	3,780
Bar iron	1,607	2,606	26,729	26,112
Structural	245	254	1,597*	3,120
Sh'ts and plates	378	204	2,453	3,300
Tin plates	410	171	14,099	2,052
Totals	19,665	21,231	256,903	225,072

*Not stated prior to July 1, 1911.

IMPORTS BY MONTHS.

	1910.	1911.	1912.
January	56,207	33,071	20,008
February	43,613	20,812	11,622
March	54,176	23,533	15,466
April	47,698	22,392	12,482
May	42,569	23,347	15,955
June	30,322	29,399	21,407
July	41,933	15,782	17,916
August	36,879	19,944	20,572
September	30,961	14,039	18,740
October	31,455	21,035	25,559
November	40,585	13,880	24,154
December	31,575	19,665	21,231
Totals	487,973	256,903	225,072

IRON ORE IMPORTS BY ORIGIN, 1912.

	December.	Year.
Spain	8,430	92,061
Sweden	18,067	333,863
Canada	10,961	106,675
Newfoundland and Labrador	20,770	145,355
Cuba	138,780	1,398,593
Other countries	2,974	28,029
Totals	199,982	2,104,576

IRON ORE IMPORTS, BY MONTHS.

	1909.	1910.	1911.	1912.
January	105,233	284,823	102,600	154,118
February	61,749	170,427	94,820	129,693
March	108,676	163,633	134,785	157,469
April	74,782	206,135	133,900	178,502
May	97,393	240,833	217,467	194,482
June	124,714	193,415	118,296	180,122
July	172,316	248,810	200,845	185,677
August	209,855	282,949	175,183	178,828
September	164,613	208,892	184,456	180,571
October	178,051	219,571	172,459	202,125
November	174,966	197,833	128,019	163,017
December	222,609	173,710	148,902	199,982
Totals	1,694,957	2,591,031	1,811,732	2,104,576

IRON AND STEEL EXPORTS, GROSS TONS.

1890	52,478	1901	700,857
1891	46,030	1902	372,398
1892	47,834	1903	326,590
1893	73,216	1904	1,167,710
1894	81,234	1905	1,010,255
1895	89,389	1906	1,325,740
1896	203,347	1907	1,301,979
1897	616,605	1908	964,242
1898	901,427	1909	1,243,567
1899	942,689	1910	1,540,895
1900	1,154,284	1911	2,187,724
		1912	2,948,466

The important increase in exports has occurred in the past two years. The 1909 exports fell below those of 1906 and 1907, and only slightly exceeded those of 1900 in point of tonnage, though there was an important increase in the average degree of finish. The 1910 exports made a new record, but exceeded those of 1906, four years earlier, by only 16 per cent. Then the really important increases began, 1911 exceeding 1910 by 42 per cent, while 1912 in turn passed 1911 by 35 per cent. From 1910 to 1912, two years, there was an increase of 91 per cent.

The record export month was May of last year, with 307,656 tons. In November and December, exports were running at the rate of a trifle over 2,800,000 tons, while, deducting scrap and pig iron, they were running at the rate of 200,000 tons a month or 2,400,000 tons a year.

Iron and steel imports in December were 21,231 gross tons, showing a decrease from October and November, but slightly exceeding the average of the 11 months ended November. The year's total shows a slight decrease from 1911, and a large one from 1910. The chief decrease in imports in recent years has been in tin plates, which are now a negligible item. Ferro-manganese is regularly imported, and in periods of exceptional activity ordinary pig iron has been imported in considerable volume.

A number of officials of the United States Steel Corporation last week inspected the Corporation's by-product coke oven plant, at Farrell, Pa.

VALUE OF IRON AND STEEL EXPORTS—TONNAGE AND NON-TONNAGE.

	1908.	1909.	1910.	1911.	1912.
January	$13,468,058	$10,329,388	$14,513,394	$18,738,391	$18,451,914
February	14,063,559	10,947,159	13,949,081	18,693,792	21,801,570
March	15,168,155	13,873,746	17,258,503	22,591,991	24,474,799
April	15,455,319	13,058,297	16,529,260	24,916,912	26,789,853
May	11,281,415	12,964,367	17,658,042	20,616,795	28,050,247
June	11,677,944	13,779,736	16,503,204	20,310,053	24,795,802
July	12,085,951	11,866,772	16,108,102	17,454,772	24,913,052
August	12,058,561	14,134,487	17,628,537	20,013,557	25,450,107
September	11,221,799	12,966,908	16,776,178	19,875,308	23,286,040
October	11,505,063	14,249,598	17,452,085	20,220,833	25,273,059
November	10,895,549	14,434,690	18,594,806	20,823,061	26,406,425
December	12,231,741	15,069,246	18,300,710	22,186,996	23,750,864
Totals	$151,113,114	$157,674,394	$201,271,903	$249,656,411	$289,128,420

EXPORTS OF TONNAGE LINES—GROSS TONS.

	1908.	1909.	1910.	1911.	1912.
January	74,353	70,109	118,681	152,362	151,208
February	81,773	84,837	110,224	150,919	204,972
March	96,681	94,519	124,980	216,360	218,693
April	93,285	100,911	117,921	228,149	267,312
May	64,041	109,808	135,306	178,589	307,656
June	69,770	114,724	120,601	174,247	273,185
July	86,796	100,850	127,578	162,855	272,944
August	86,244	105,693	131,391	177,902	282,835
September	76,732	97,641	119,155	181,150	248,746
October	85,766	110,821	129,828	186,457	250,611
November	71,130	116,105	155,138	187,554	233,341
December	77,659	137,806	150,102	190,854	235,931
Totals	964,242	1,243,567	1,540,895	2,187,724	2,948,466

LATEST MACHINERY NEWS COLLECTED IN LEADING MANUFACTURING CENTERS

A summary of the machinery and machine tool trade during the past month shows that an unusually large number of orders and inquiries for that time of the year was received by the manufacturers and dealers throughout the country. This business was unusually well distributed, probably due to the fact that a large number of the companies were unable to take orders for early deliveries. Business for the past week has shown a slight slump, which is attributed to the number of building projects held up by weather conditions. Prospects for a large volume of business in the immediate future are exceptionally bright.

In New York, reports of business conditions in the machinery trade vary. Some houses booked more orders in February than in January, while others complain of pronounced dullness. Casting up the general situation, however, the month was fairly satisfactory. The largest single buyer of shop equipment was the American Locomotive Co. It is said that upwards of $300,000 worth of replacement orders was given out by that company. This is the first important buying that has been done by the manufacturers of railroad equipment since the improvement in orders started last year. Local dealers believe there is every reason to expect other interests to come out with large lists of requirements during the year. The Mead-Morrison Mfg. Co. has put out a list of plant equipment including about 50 items. Punches, rolls, planers, shears, threading, bending, and riveting machines are included. The equipment is intended for the large plant proposed at East Boston.

In Pittsburgh, a good volume of business continues to be enjoyed by builders and dealers of machine tools and rolling mill equipment. The Pittsburgh & Lake Erie railroad is asking bids on a list of about two dozen tools, most of which are of wood-working types, for installation in shops in that district. Rolling mills have an unusually large number of tentative inquiries on hand, coming from the Pittsburgh and Cleveland districts. Overhead traveling and locomotive cranes continue to be in good demand, and it is probable that a number of good awards will be made shortly. Demand for machine tools is well distributed.

In Chicago, activity in the machine tool trade appears to have decreased slightly, although business is keeping up at a very encouraging rate. Most of the larger industrial lists have finally been completed and no new rail inquiry is noted. No sale resulting from the inquiry of the Pere Marquette about two weeks ago has been reported, however. The arrival of real winter for the first time this season has held up a number of building projects, but it is expected that machine tool activities will be renewed when these projects can be taken up again. The most important item during the past week was the official announcement by the Chicago & Northwestern Railway Co. of plant referred to in THE IRON TRADE REVIEW *last week, which includes the purchase of a large volume of machine tools and machinery.*

In Cleveland, machine tool dealers are enjoying a satisfactory volume of business and the aggregate of orders taken and inquiries received is heavy. While no large lists were received in that district last week, there is a heavy volume of prospective business before the trade and indications point to a continuance of the present good conditions for some time ahead. A number of orders were closed last week that aggregated a good volume. The largest inquiry before the trade is the list sent out a few weeks ago by the central Ohio steam shovel interest.

In Cincinnati, the fact that the jobbing foundry business has fallen off slightly, indicates that machine tool business in that city is not improving to any extent. Machine tool orders since the first of the year have totaled less than for the last three months of last year. Most of the business done recently has been for foreign shipments, as the prospective buyers in this country prefer to wait until they can better judge the policy of the new administration in Washington. Some machine tool plants also have not cared to book too many domestic orders, owing to this same reason. Builders of gas engines are enjoying a much better business, due mainly to the fact that the automobile and motor boat seasons are beginning to open. Woodworking machinery is in fairly good demand, as is also small electrical equipment.

ALABAMA

The Silurian Ore Co., Birmingham, has been incorporated; $40,000; president, T. H. Aldrich Jr.; vice president, N. L. Steele, and secretary-treasurer, T. H. Aldrich Sr.

The National Cast Iron Pipe Co., Birmingham, will build a plant at Boyles at a cost of approximately $200,000. A. H. Ford is president of this company, and E. E. Linthicum, general manager.

Notice has been filed in the office of the probate judge, Jefferson county, that the capital stock of the Standard Steel Co., which will take over the properties of the Southern Iron & Steel Co., has been increased from $2,000 to $100,000. There probably will be a further increase.

ARIZONA

The Phoenix & Copper Creek Railroad Co. has been incorporated to build a railroad from Copper Creek to Mammoth, 13.4 miles; will be 30-inch gage, of 40-pound rails. Roy Sibley, Phoenix, is superintendent of the Copper Creek Mining Co., the parent organization.

ARKANSAS

The Fort Smith Iron & Steel Co., Fort Smith, has been incorporated to engage in mining and railroad business; $50,000; by J. A. Arnold, Bethlehem, Pa.; W. M. Murray, Arkhoma, Okla.; J. H. Vaughn, Fort Smith.

CALIFORNIA

The Fraunceger Ornamental Iron & Wire Co., Oakland, recently suffered a loss estimated at $10,000 in a fire that destroyed the block in which it was located.

The Olympia Cotton Mill of Southern California, has been incorporated to erect a plant at San Pedro or Los Angeles Harbor; $2,500,000; by M. W. Durham, C. W. Durham, C. F. Hamberg, Los Angeles.

The Nenzel Electric Power Co., Sacramento, is planning to build a power plant at Oreana. This company was recently organized with a capital of $250,000. The incorporators are Joseph Nenzel, Joseph Sullivan, J. A. Causten and J. Berger.

The work on the new municipal electric light plant and power plant at Alameda is progressing rapidly. The machinery from the old plant, which will be traded in on the new machinery, is being removed, and the new power plant proper will soon be under way.

Construction is about to be started on the proposed $750,000 plant of the Llewellyn Iron Co., at Torrance, near Los Angeles. Seven buildings and an office are planned. The main structure and boiler shop is to be 175 x 540 feet; the warehouse and machine shop each 105 x 302 feet; the power house, 75 x 105 feet; the foundry 80 x 198 feet; the pattern shop 80 x 150 feet, and the pattern storage house will be 58 x 195 feet.

CONNECTICUT

The Bridgeport Brass Co., Bridgeport, has certified to an issue of 1,000 shares of stock, bringing the total outstanding stock to $1,200,000.

Fire recently destroyed the plants of the Trumbull-Vandepoel Electric Co., and the Flynn & Doyle Carriage Mfg. Co., at Bantam, causing a loss of approximately $40,000.

The American Metal Hose Co., Bridgeport, has issued the remaining 250 shares of its original $50,000 capitalization and has certified to an increase of capitalization to $150,000.

Liabilities of $456,439.93 are shown by the report of Edwin L. King, receiver of the Pratt & Cady Co., Hartford, which has been filed in the superior court.

The Waterbury Standard Tool & Machine Co., Waterbury, has filed its certificate of organization; $2,500; officers are: President, Emil Hummel; treasurer, Jeremiah W. Phelps; secretary, Thomas N. Prentice.

The New York, New Haven & Hartford railroad is planning a new bridge over the Thames river, at New London, to take the place of the present structure. Cost, $2,000,000. W. H. Moore, New Haven, Conn., is engineer of bridges for the road.

The McArthur Concrete Pile & Foundation Co., 11 Pine street, New York City, has been awarded the contract for placing the foundation of the Malleable Iron Fittings Co.'s new annealing building, at Branford. Concrete and steel piles are to be driven, and the McArthur company will install the complete foundation, ready for the steel superstructure. Phillip Sellers, New Haven, is the architect.

DELAWARE

The Pennsgrove Electric Light, Heating & Power Co., Wilmington, recently awarded contracts for the erection of its new plant at that place.

The American Silencer Co., Camden, has been incorporated to manufacture silencers for automobiles; $50,000; by F. R. Hansell, Philadelphia; George H. B. Martin, and S. C. Seymour, Camden.

The Victor Cotton Harvesting Co., Wilmington, has been incorporated to manufacture cotton harvesting and compressing machinery; $600,000; by R. Boyd Cooling, Clarence J. Jacobs, Harry W. Davis, all of Wilmington.

The Kootenai Falls Power Co., Wilmington, has been incorporated to manufacture, generate, store and transmit electric current; $11,000,000; by Herbert E. Latter, W. J. Maloney and Norman P. Coffin, all of Wilmington.

DISTRICT OF COLUMBIA

Bids will be received until 10:30 a. m., April 14, by Major F. C. Boggs, general purchasing officer, Isthmian canal commission, Washington, for furnishing and erecting, under circular 763, coal handling machinery and accessories for two coal handling plants.

Proposals will be received until 10 o'clock a. m., March 11, at the bureau of supplies and accounts, navy department, Washington, D. C., for machine tools, schedule 5189; brass squirt cans, schedule 2507; semi-finished steel bolts and nuts and gage glasses, schedule 5210.

Bids will be received until 10 a. m., March 11, by R. V. Ladow, superintendent of prisons, department of justice, Washington, for furnishing and delivering at Atlanta, Ga., structural steel and iron to and including first floor framing for bath, laundry and tailor shop building in federal penitentiary.

FLORIDA

Bids will be received until 4 p. m., March 17, by the board of public works, Gainesville, at the office of H. E. Taylor, chairman, for furnishing material, machinery and labor for the construction of an electric lighting system and improvements to the waterworks system. Will include 20 miles pole line, 4,300 feet 14-inch cast iron pipe, one 150,000-gallon tank on 75-foot tower; three 150-horsepower return tubular boilers, one 600-horsepower steel or reinforced concrete stack, one 600-horsepower feedwater heater and purifier, one 1,500,000-gallon high-duty Meyer gear or triple expansion pump, one cross-compound condensing compressor 750 cubic feet capacity, one 250 and one 150-kilowatt generator, direct connected to 4-valve non-condensing Corliss or compound engine, switchboards and exciters. Specifications and blanks from the J. B. McCrary Co., engineers, 1408-1417 Third National Bank building, Atlanta, Ga.

GEORGIA

The machine shop of L. J. Bentley, 1 LaFrance avenue, Atlanta, was seriously damaged by fire recently.

The Southern Art Metal Co., Americus, advises it has placed contracts for building materials and machinery for the new plant it is to erect.

A six-log washer and other mining equipment are being installed at the plant of the Pulaski Iron Co., Grady. J. W. Houseale, of Cedartown, is in charge of the work.

Contracts have been let for the construction of the Healey building, at Atlanta. The American Bridge Co. has received the contract for the steel, close to $200,000; the Otis Elevator Co. will furnish the elevators, about $70,000; the Stone Mountain Granite Corporation gets the contract for $10,000 worth of granite.

ILLINOIS

The Elgin Wheel & Engine Co., Elgin, has certified to an increase in capital from $30,000 to $40,000.

The Automobile Construction Co., 2637 Cottage Grove avenue, Chicago, has certified to an increase in its capital stock from $27,000 to $100,000.

The National Metallic Sash Co., 602 Austin avenue, Chicago, has certified to an increase in capital stock from $2,500 to $28,000.

The McIlroy Belting & Hose Co., of Illinois, 138 North LaSalle street, Chicago, has changed its name to the Calumet Belting Co.

Ohio Moline Plow Co., Moline, has been incorporated; $50,000; L. C. Blanding, J. L. Irvington, C. A. Banister.

The Polo Machine Co., Polo, is disposing of additional stock to enable an enlargement of the plant to meet demands.

The Emerson-Brantingham Co., Rockford, has razed a 38-foot hill at a cost of $100,000 to provide a site for its foundry and warehouse. Rock was encountered in the excavation.

The Continental Sales Co., Chicago, has been incorporated with a capital of $50,000 to manufacture and sell machinery. The company may be addressed at 923 Hearst building, Chicago.

The Scientific Work Shop, Chicago, has been incorporated with a capital of $15,000 to manufacture machinery. The company may be addressed in care of Preston Clark, 169 West Washington street, Chicago.

The Coke-Otto by-product plant at Hamilton, has just completed the installation of a Jeffrey coal mixing machine at a total cost of $60,000, and as a result high grade metallurgical coke is now being turned out.

The United Talking Machine Co., Chicago, has been incorporated with a capital of $2,500 to manufacture talking machines. The company may be addressed in care of Robert Johns, 610 South Dearborn street, Chicago.

A permit has been granted for the erection of a two-story factory building for the Century Rubber Works, 1346 Rawson street, Chicago. The building will be 25 x 148 feet. F. D.

Chase, 122 South Michigan avenue, is the architect.

The Automatic Filling, Capping & Sealing Machine Co., St. Charles, has been incorporated with a capital of $25,000 to manufacture and deal in machinery appliances. The company may be addressed in care of Fred J. Mosedale, St. Charles.

A permit has been granted for the erection of a one-story brick building for the Garden City Foundry Co., 3160 Archer avenue, Chicago. Estimated cost, $14,000. Postle & Fischer, 140 South Dearborn street, are the architects.

The Economical Heater Co., Chicago, has been incorporated with a capital of $10,000 to manufacture heating and plumbing apparatus. The company may be addressed in care of Robert W. Dunn, Otis building, Chicago.

The Atwill-Makemson Coal & Coke Co., McCormick building, Chicago, will be the exclusive distributor of crushed coal from the plant of the Coal Products Mfg. Co., Joliet, after May. 15.

The Joliet Rolling Mill Co., Joliet, property has been sold to Frederick Cowin & Co., who will make changes and additions and engage in lines of manufacture other than bar iron, the former product. James Longley is manager for the new concern.

The Johnson Specialty Co., Chicago, has been incorporated with a capital of $2,500 to engage in a general manufacturing business. The company may be addressed in care of Richard H. Mather, Otis building, Chicago.

The Hurley Electric Tool Co., Chicago, has been incorporated with a capital of $5,000 to manufacture and deal in electrical tools and machinery. The company may be addressed in care of Neil C. Hurley, 21 South Clinton street, Chicago.

A permit has been granted for the erection of a two-story factory building for the Barrett Mfg. Co., Otis building, Chicago. The new building will be located at 2900 South Sacramento street, and will cost approximately $9,000.

The Chicago & Northwestern Railway Co., Chicago, advises that it has in view the erection of a new repair shop at Clinton, Ia., estimated to cost when equipped with tools and machinery about $400,000. In addition to this the company will buy tools for other shops at a total cost of $75,000.

A permit has been granted for the erection of a factory building, 85 x 48 feet, three stories, for J. B. Madsen & Co., at 1743 Grand avenue, Chicago. The present location of the company is 450 North Hermitage avenue. H. E. Stevens, 53 West Jackson boulevard, is the architect.

The James S. Miller Co., Chicago, has been incorporated with a capital of $60,000 to do a general railroad supply and scrap iron business. The company may be addressed in care of James S. Miller, McCormick building, Chicago.

Peoria capital backed by the C., B. & Q. railroad, is planning to erect a $500,000 factory building in Peoria, on ground adjacent to the C., B. & Q.'s tracks, for the accommodation of small factories which can be induced to move to that city, where they will be afforded rentals and power at a minimum cost.

The Kieley Steam Specialty Co., Chicago, has been incorporated with a capital of $2,500 to manufacture and deal in automatic air and water regulating devices. The company may be addressed in care of William J. Moore, 420 Ashland block, Chicago.

The Plumbing Sales Co., Chicago, has been incorporated with a capital of $15,000 to manufacture and deal in plumbers' and steam fitters' supplies. The company may be addressed in care of William A. McGuire, 72 West Adams street, Chicago.

Fire in a building at 215-23 West Congress street, Chicago, recently caused severe damage to the plants of Gallagher & Speck, machinists; F. C. Damm, linotype machinists; Printers Mfg. Co., International Waterproofing Co., and the Wanner Machinery Co.

The North Western Expanded Metal Co., Chicago, advises its recent increase in capital stock is to take care of business requirements and the concern is not in the market for machinery as it builds its own equipment. No buildings are to be erected at present.

Sargent & Lundy, Chicago, who have designed many of the largest power plants in that city, were retained recently as consulting engineers by the Kentucky Utilities Co., Lexington, Ky., to plan a new electric plant for Somerset, Ky. The plant will include water tube boilers and a steam turbine set.

The National Refillable Fuse Co., Chicago, has been incorporated with a capital of $50,000 to manufacture electrical appliances. It may be addressed in care of Edward G. Woods, Otis building, Chicago. The company's plans are immature at present, although it is probable that the company will not be located and in the market for equipment for some time.

The Brand Novelty Mfg. Co., Chicago, has been incorporated with a capital of $5,000 to engage in general manufacturing. The company may be addressed in care of Adolph D. Weiner, 127 North Dearborn street, Chicago. Its future plans have not been perfected, however, and probably nothing will be done in the way of permanent location for some time.

The L. K. Sherman Co., Chicago, has been incorporated with a capital of $50,000 to do a general engineering and contracting business. The company has previously done business under the name of L. K. Sherman & Co., 3046 West Thirty-sixth street. Mr. Sherman advises that no material change in the company's business is involved, the incorporation being merely for the purpose of taking new members into the firm.

George D. Roper, Rockford, largely interested in local industries, including the Eclipse Gas Stove Works, the Trahern Pump Co. and the American Foundry Co., has bought from R. H. Tinker the latter's water power rights now used by a number of small shops. With W. H. Gaffney and M. J. Green, he has organized a new company to develop the property. A modern hydro-electric plant will be built. The plans are understood to include equipping with three low-head vertical turbines and umbrella-shaped generators of the type used under similar conditions at Marseilles, Ill., and now being installed at Keokuk, Iowa, on a large scale.

W. E. Wood and Henry Raeder, composing the firm of Raeder & Wood, architects, with office in the Great Northern building, Chicago, have dissolved partnership. Mr. Wood has opened an office as an industrial engineer. Mr. Raeder has been the architect of the firm and will remain in the firm's former offices in the Great Northern building, following a strictly architectural practice. Mr. Wood has opened offices at 624 Harris Trust building, Chicago, and will devote his attention largely to engineering work and designing layouts for industrial plants, working in conjunction with architects. The firm of Raeder & Wood has designed many plants in the Chicago district, that of the Chicago Steel Foundry Co., recently described in THE IRON TRADE REVIEW, being among the number.

INDIANA

The Martinsville Gas & Electric Co., Martinsville, has increased its capital stock from $100,000 to $125,000.

The Kokomo Gas Co., Kokomo, has filed notice of increase of its capital stock from $100,000 to $400,000.

The Madison Light & Railway Co., Madison, has annonuced an increase of stock from $75,000 to $150,000.

The county commissioners at Richmond have plans for the construction of four new bridges in that county.

The Perfection Septic Tank Co., Indianapolis, has been incorporated to manufacture and sell septic tanks; $25,000; by Charles F. Surface, Arthur A. McKain, A. Dayton Rinker.

The Hoover-Robertson Co., Indianapolis, has been incorporated to deal in iron and building material; $10,000; by Lewis Hoover, H. E. Robertson and L. H. Van Briggle.

The Sedgwick Mfg. Co., Richmond, has been incorporated to operate a factory making an automobile jack; $10,000; by Richard and J. R. Sedgwick and James M. Judson.

The Hammond Machine & Forge Works, Hammond, has been incorporated to operate a forge and machine shop; $25,000; directors, Daniel Bruhn, Selma Bruhn, Edwin Bruhn.

The commissioners of Madison county will open bids on March 14 for three steel bridges and one reinforced concrete bridge in that county, plans for which are on file with J. D. Benefiel, county auditor.

The Modern Make Mfg. Co., Goshen, has been incorporated to manufacture self-heating irons; $400,000; by Elmer E. Ash, Frank L. Krug, Clinton C. Tiedeman, Willis V. Brundage, Edward E. Tiedeman, J. D. Marmaduke.

The Indianapolis Parcel Post Scale Co., Indianapolis, advises it has been engaged for two months in making parcel post computing scales and has just incorporated. Novelties will be manufactured as a by-product to utilize scrap material left from the scale making. The officers are: President, G. W. Miller; vice president and general manager, C. M. Crawford;

secretary and treasurer, W. A. Schafer; attorney, William H. Faust.

The Noelke-Richards Iron Works, Indianapolis, has secured the contract for the ornamental iron and bronze work to be used in the new main office building of the Cincinnati & Suburban Bell Telephone Co., Cincinnati. The contract calls for about $50,000 worth of materials, and was secured through A. T. Hazen, the Cincinnati representative of the Noelke-Richards company.

IOWA

The Hart-Parr Co., Charles City, is planning to erect a new machine shop during the coming summer.

The Krell Mfg. Co., Hampton, is inquiring for machinery for a planing mill.

It is probable that new boilers and one or more generating units with auxiliary equipment will be added to the plant of the Creston Mutual Electric Light & Power Co., Creston.

R. O. Beck, Sioux City, and C. F. Hassenstein, Chicago, have formed the firm of Beck & Hassenstein, to specialize in jobbing to contractors, handling building material, structural steel and supplies.

KENTUCKY

The Damon Mfg. Co., Bowling Green, has certified to an increase of capital from $2,500 to $20,000.

W. A. Burkhardt, Vine Grove, is having plans prepared for an electric power plant.

The Louisville Cotton Mill Co., Louisville, is considering equipping its entire plant with electric motors to replace shafting.

The Middle West Utilities Co., Chicago, which controls the public utilities of Somerset, has announced that a new power plant will be erected there.

N. G. Hemphill, Clinton, Tenn., is preparing to erect an electric light plant at Hazard. About $5,000 will be spent in the equipment of the station.

F. A. Clegg & Co., Louisville, have the contract for the installation of a central heating plant at Bethel college, Russellville.

The wrecking of an engine and dynamo in the power house of the Lexington Laundry Co., Lexington, may require the purchase of additional machinery.

The Kentucky Utilities Co., Winchester, is securing options on the electric light plant at Sharpsburg, and plans to build a railroad line between the two towns.

R. H. Evans, 227 Third street, North, Nashville, has announced that an automobile factory costing $200,000 will be erected in that city. He is said to represent Detroit interests.

A ten-story steel frame hotel building will be erected at Paducah, by the Palmer Hotel Co., at a cost of $250,000. The name of the architect has not yet been announced.

The fiscal court of Jefferson county at Louisville will open bids March 15 on a pumping station and heating plant to be installed at the county poor-house. B. B. Davis, Louisville, is the architect.

The Speedway Tire Co., Realty building, Louisville, will be able to buy machinery at once for its automobile tire factory, having purchased a building. It was thought that new buildings would have to be erected.

The firm of Hagan & Walters has been formed to operate a machine shop in Winchester. Nelson Walters and Charles Hagan compose the concern, Mr. Hagan having operated the business individually heretofore.

Important improvements, involving the purchase of power and special machinery, will be made by C. C. Mengel & Bro. Co., Louisville. The concern is now operating a large mahogany sawmill. Its capital stock has been increased from $1,700,000 to $3,500,000.

The Kentucky Utility Co., Lexington, has purchased a franchise at Pleasureville, and will furnish current from the Shelbyville plant, which will be enlarged for this purpose. The company is also reported to be planning the erection of a hydro-electric plant at Cumberland Falls.

The Realty Investment Co., Louisville, will erect a five-story apartment house costing $200,000, at Fourth avenue and Ormsby street. H. J. Scheirich, Inter-Southern building, Louisville, is one of those interested. A fair amount of steel will be required in the building.

The Consolidation Coal Co., with general offices in Baltimore, Md., has announced plans for the erection of a large power plant at Van Lear, Johnson county, to be operated jointly with a large station now being completed at Jenkins. The company's machine shop at Jenkins recently was burned, and the company, as a result, may be in the market for machine tools.

George Bowers, United States commissioner of fisheries, Washington, D. C., has announced the details of the machinery purchases to be made for the hatchery to be established at Louisville. A pump house and transformer room will be equipped, and two 60-horsepower motors, with turbo-impeller pumps, will also be purchased.

The Wedgerite Chemical Co., Louisville, manufacturer of high explosives, is planning to install motor drives throughout its plant. No power plant will be built, however, as arrangements have been made with the Louisville Lighting Co. to extend a transmission line to the property, some distance from the city, below Kenwood Hill.

The American Bridge Co., which recently completed the construction of a $2,000,000 bridge over the Ohio river at Louisville for the Kentucky & Indiana Terminal Railroad Co., is dismantling the old bridge. Acetylene torches are used to sever the connections, and each span is allowed to drop into the river. The material is conveyed to the bank in barges.

LOUISIANA

The management of the city light and water plant at St. Francisville, has under consideration plant improvements to cost $6,000.

The North Louisiana Electric Railway Co. is being incorporated to build a line from Shreveport to Monrovia, 100 miles; $1,000,000. Officers are: President, A. B. Blevins, Shreveport; vice president, A. Kinnebrew, Homer, La., and secretary-treasurer, G. H. Walker, Shreveport. Power plant to be at Shreveport.

MAINE

M. Lynch & Co., agents for the J. Baum Safe & Lock Co., Cincinnati, O., have received the contract for ten steel vaults for the new building of the Bangor Real Estate Co., Bangor.

MASSACHUSETTS

The charcoal blast furnace of the Richmond Iron Co., Cheshire, has been shut down for repairs and probably will be idle some time.

Condition of the Knox Automobile Co., shown by schedules filed in the bankruptcy case in Boston show liabilities of $1,286,409, of which $24,500.

Property has been bought by the Oliver Whyte Co., Inc., Cornhill, on which a factory building, 100 x 100 feet, four stories, will be erected.

The Whyte Co., manufacturer of ornamental bronze, brass and steel work, will build a new plant at Hancock street and Mystic avenue, Medford.

The Miller River Power Co., Springfield, has been incorporated; $1,000,000; directors are: President, Fred T. Ley; Leo L. Ley and J. W. Johnston, all of Springfield.

The Robinson Bramley Co., Lawrence, has been incorporated; $5,000; directors are: President, Edwin Bramley; treasurer, Arthur L. Searle, Methuen; and P. D. Smith.

The Automatic Air Brake Co., Boston, has been incorporated; $300,000. Directors are: President, H. H. Robinson; treasurer, William P. Collins, 201 Devonshire street; and J. P. Robinson.

The Worcester Consolidated Street Railway Co. is erecting a switch-house in Millbury, Mass. It is to be 20 x 92 feet, brick and concrete, and will cost $9,000. Modern equipment is to be installed.

The Gray & Davis Co., manufacturers of automobile lamps, has awarded the contract for a factory building to be erected on the Charles river near Cambridge. The Aberers Construction Co., of Boston, received the contract, which calls for a five-story reinforced concrete building. The work will be pushed, in order to reach completion by July 1.

J. F. Sheppard, of the Dover Machine Works, Dover, has taken over the National Woodworking Machinery Co., of Manchester, and will amalgamate the two companies. The equipment of the Manchester plant will be moved at once, and installed in a new addition to the Dover company's plant, making it one of the largest manufacturers of wood-working machinery in the country.

The Mead-Morrison Mfg. Co. will erect a large plant at East Boston. It is said that the plant when completed will be the largest for the manufacture of hoisting engines in the United States. It will include a plate shop, erection shop, machine shop, pattern shop, foundries and a power plant. The contract for the plate shop has been awarded to the Levering & Garrigues Co., Dunellen, N. J. The McClintic-Marshall Construction Co. will build the machine

and erecting shops. The New England Foundation Co. will construct the foundations. Orders have been placed for a part of the equipment for the various buildings, including one 25-ton and four 10-ton electric cranes. The Shaw Electric Co. will furnish the latter.

MICHIGAN

The National Fence Machine Co., Battle Creek, has engaged in business here after incorporation; $50,000.

The Superior Foundries Corporation, Detroit, has been incorporated to do a general foundry business; $30,000.

The Royal Sheet Metal & Heating Co., Royal Oak, will start at once rebuilding its plant recently damaged by fire.

The Lyons Machine Co., Lyons, is to move to Muskegon shortly, plans having been drawn for a plant at Muskegon Heights.

Financial arrangements are being completed by which the Eastern Edison Co., Detroit, will soon have $600,000 available for improving and extending its system and buying additional power machinery.

Warden Fuller, Ionia, has asked the state legislature for an appropriation of $80,000 to rebuild the factory recently burned at the reformatory. His estimates provide for a building, 75 x 380 feet, three stories, to be equipped with a sprinkler system and power for elevators.

The Frederick Kahl Iron Foundry Co., Detroit, established nearly thirty years ago, reports its tonnage of castings for 1912 the greatest in its history and the sales for January this year are far ahead of the corresponding period of last year. It has added a heavy motor truck to its equipment to facilitate deliveries.

The Solvay Process Co., Detroit, has taken out a building permit for the construction of a ten-story factory building to be erected at the foot of West End street, that city, as an addition to its present extensive plant in old Delray. The structure will be of steel and concrete, 120 x 144 feet, to cost approximately $200,000. Work is to be started early this spring.

Woodmansee, Davidson & Sessions, Chicago, consulting engineers, are completing plans for a 2,000-kilowatt municipal power plant for Kalamazoo. The main equipment has been bought, but considerable accessory apparatus will be bought later. The boilers will be furnished by Wickes Bros. Co., Saginaw; steam turbine by the General Electric Co., Schenectady, N. Y.; condensers by the Wheeler Condensor & Engineering Co., Carteret, N. J.

MINNESOTA

The Oliver Iron Mining Co. is doubling the concentrating capacity of its new ore washing plant at Coleraine.

Bids will be received until 8 p. m., Feb. 28, by H. J. Bierge, Pine City, village recorder, for a complete waterworks system in accordance with plans on file with the Oscar Claussen Engineering Co., consulting engineers, 514 German-American National Bank building, St. Paul. Beside cast iron pipe, there will be required a 75,000 gallon steel tank and tower 100 feet to balcony, and pumping machinery.

The Albany Sash & Door Mfg. Co., Albany, is being organized and is to build a plant at St. Cloud. The stockholders are J. F. Kreig, St. Cloud; John Merz, Albany; Charles Steinwarih, St. Cloud.

The Pittsburgh Steel & Ore Co., Duluth, has been incorporated to do general smelting and mining business; $500,000; by P. H. Nelson, Duluth; Edward H. Binder, Willis F. McCook and Wallace H. Rowe, Pittsburgh.

MISSOURI

The Federal Plate Glass Co., St. Louis, will rebuild its burned plant at Ottawa, Ill. The plant, which will be enlarged, will be of steel and brick, to cost $250,000.

Plans are under way at Springfield to construct an independent electric light and power plant, obtaining power from the White river hydro-electric installation. Pledges of $200,000 have been secured and 1,500 kilowatts capacity is planned.

Application to congress has been made by James D. Houseman, of St. Louis, for franchise for a bridge across the Mississippi and one across the Missouri river. The former is to cost $1,500,000 and the latter $900,000, both to be part of the interurban electric system to be known as the St. Louis & Western Traction Co. and the St. Louis Belt, Illinois & Eastern Traction Co.

The beginning of an important power system, which will mean the purchase of motors and other electrical equipment, and the starting of new industrial plants over a wide territory, is to be made April 15, by the Ozark Power & Water Co., Springfield. Its 15,000-horsepower hydro-electric plant on the White river is practically completed. Power will be transmitted as far as the mines, mills and smelters of the Joplin lead-zinc district.

MONTANA

L. W. Stacey and associates, Miles City, are promoting a beet sugar factory for that city.

NEW JERSEY

Plans are being prepared for a plant, 300 x 190 feet, which will be erected at Paterson for the Stonemeal Fertilizer Co., Inc.

The Thatcher Furnace Co., 38-40 St. Francis street, Newark, will spend about $13,000 for improvements at its plant in that city.

The board of public works, South River, has decided to enlarge the city's power plant and install additional machinery.

Clarence Soden has been awarded a contract to overhaul and build some new engines for the Kinkora plant of the Independent Brick Co.

The Panama Development Co., Trenton, has been chartered to promote railroads, agriculture and mining in Panama; $100,000; by John Critchlow, Salt Lake City; H. H. Willoughby, Staunton, Ill., George M. Childs, Granite City, Ill.; Charles N. Beyham, Albion, N. Y. Offices are in the Mechanics Bank building, Trenton.

The American Bridge Co. has granted voluntarily an increase in wages to the 400 employes of the Trenton plant. The increase runs from 10 to 25 cents a day.

The Guerber Engineering Co., Bethlehem, Pa., has taken a contract to erect a blacksmith shop at Communipaw for the Central Railroad of New Jersey.

The city council of Elizabeth has appointed a committee of five from its members to make preliminary investigation of plans for installing a municipal electric light plant.

The American Trimmer Mfg. Co., Hoboken, has been incorporated to do a general manufacturing business; $120,000; by P. J. McGann, Weehawken; J. Callery, Weehawken, and W. Kohn, Hoboken.

A brick and steel addition will be made to the city hospital, Newark, estimated to cost $223,575. In connection with this improvement a power house will be constructed and equipped.

The Dover Boiler Works, Dover, advises that it recently built a new machine shop, 40 x 150 feet, thoroughly equipped with modern machinery, increased its forge shop to twice its former capacity and built a new tool room and new storage buildings.

The Rice Gas Engine Co., Bordentown, has closed down for an indefinite period. About seventy-five employes are affected. As soon as financial matters are straightened out the plant will be put into operation again.

The William R. Thropp & Sons Co., Trenton, is busy turning out a large order of rubber machinery for a big rubber plant in Boston. The machinery includes grinders and washers. The Thropp company recently erected a large addition to its Trenton plant.

The Emerson-Brantingham Implement Co. is to spend $15,000 for additions and improvements to its Trenton plant. C. S. Brantingham and G. A. Lathrop, directors of this company recently visited Trenton to go over the plans for improvements. The company has a capital of $50,000,000 and is one of the largest manufacturers of agricultural implements in the world.

The American Steel Frame & Band Iron Co., Inc., New York City, advises that the recent incorporation noted by THE IRON TRADE REVIEW is in effect a renewal of the old corporation which expired Dec. 27 and by an oversight application for renewal was not made. It, therefore, was necessary to re-incorporate. The new corporation is practically the same as the old, takes over all the assets and liabilities and will continue the business as before. There will be no change in the management. The officers are: President, Harris Danzig; secretary-treasurer, Benjamin Markowitz.

NEW MEXICO

The power transmission system of the Pecos Valley Gas & Electric Co., Artesia, is to be extended and addi-

tional machinery provided for the generating station.

Additional machinery is to be provided for the plant of the Tucumcari Light & Power Co., at Tucumcari.

NEW YORK

The Acme Read Machinery Co., Frankfort, is adding a new building to its plant, 50 x 250 feet.

The Schmidt Bros. Machine Works, New York City, has been incorporated; $15,000; by Godfrey F. Schmidt, Peter Schmidt Jr., Thomas A. Hull, 170 Broadway.

The Kirkham Aeroplane & Motor Co., Savona, has been incorporated to manufacture motors; $100,000; Chas. B. Kirkham, Edwin H. Skinner and Stanley I. Vaugh, Savona.

The Consolidated Car Heating Co., 413 North Pearl street, Albany, is having plans prepared for a new four-story factory building. W. H. Van Guysling, architect, is preparing the plans.

The Bay River Ice Mfg. Co., Brooklyn, has been incorporated to manufacture and operate ice-making plants; $200,000; by William H. Dohrmann, John Auer Sr., and Charles Auer, 552 Decatur street, Brooklyn.

The Interborough Iron Works, Brooklyn, has been incorporated; $3,000; by Meyer Weingrad, 1885 Douglas street; Morris Kramer, 540 Rockaway avenue; Simon Isaacson, 96 Bristol street, all Brooklyn.

The Ferguson Steel & Iron Co., Buffalo, advises that site and material for its new plant have been bought, as well as the larger equipment, traveling cranes, punches, shears, etc., but small tools, chain blocks, air hammers, etc., are yet to be secured.

Plans have been filed with the building department of New York for a seven-story factory building to be erected on Kent avenue, near DeKalb avenue, Brooklyn. The structure will cover a plot 267 x 85 feet, and is estimated to cost $150,000.

The Pearsall Co., New York City, has been incorporated to manufacture heavy machinery, tools, etc.; $100,000; by Gilbert H. Pearsall, West Orange, N. J.; Harry H. Linton, The Manchester, New York City; Edward B. Hine, Vanderbilt hotel, New York City.

The King Sewing Machine Co., Buffalo, has been given a permit to build a foundry in connection with its shops, to cost $35,000; J. Devine & Co. has been given a permit to build an office, power house and machine shop at its plant, 1372 Clinton street, to cost $20,000.

Ackerman & Baird, New York City, have received a charter to manufacture and sell machinery, etc.; $10,000; by Raymond P. Ackerman, Hotel St. George, New York City; Andrew D. Baird II, 578 Madison street, Brooklyn, and Andrew D. Baird, 140 Hewes street, Brooklyn.

The Manhattan Machine Co., New York City, has been incorporated to manufacture machinery, engines, tools and foundry supplies; $1,000; by Harry Weissman, 222 Henry street, New York City; Martin Rosenfeld and Maurice S. Rosenfeld, both of 1829 Holland avenue, Bronx, New York City.

NORTH CAROLINA

The Maysville Cotton Mills Co., Maysville, has been incorporated; $100,000; officers, president, E. L. Mattocks; secretary, Jesse G. Brown; treasurer, R. L. Jenkins. Will install 5,000 spindles, driven by electric power in new brick plant to be erected.

Erlanger Bros., of New York, and George W. Montcastle, president of the Bank of Lexington, have let contracts to the Howard & Bullough American Machine Co., of Pawtucket, R. I., for machinery to equip a proposed cotton mill at Lexington.

OHIO

Hamilton has passed a $30,000 bond issue for extending the city waterworks.

The plant of the Peet Machine Co., Cleveland, was slightly damaged by fire Feb. 26.

The Air Friction Carburetor Co., Dayton, has increased its capital stock from $20,000 to $30,000.

The John W. Brown Mfg. Co., Columbus, has certified to an increase of capital from $175,000 to $220,000.

The Bowlus Ice Co., Fremont, has contracted for a large amount of machinery for increasing the output of its plant.

The Little Giant plant of the Toronto Fire Brick Co., Toronto, O., at Steubenville, was partially destroyed by fire recently.

The repair shops of the Big Four railroad, Sixth street and Millcreek, Cincinnati, were damaged to the extent of about $4,000 recently. About half the plant was destroyed.

The Thew Automatic Shovel Co., Lorain, has received bids for the steel to be used in building an addition to its erecting and blacksmith shops, estimated to cost $10,000.

The National Marking Machine Co., Cincinnati, has leased new and larger quarters in the building formerly occupied by the Sullivan Printing Works Co., on Gilbert avenue, that city.

The Columbus Railway Supply Co., Columbus, has been incorporated; $10,000; by George A. Johnson, J. N. Dudgeon, George R. Thompson, O. C. Huegelshafer, R. D. Howie.

The McGraw Tire & Rubber Co., East Palestine, has increased its capitalization from $100,000 to $1,000,000. John S. Wilson and James C. Chaplain, both of Pittsburgh, are directors.

James L. Stuart, Oliver building, Pittsburgh, has been awarded a contract for the erection of a $100,000 addition to the Stambaugh building, Youngstown. The addition will be of brick, concrete and steel construction.

Manufacturing potters of Roseville, Crooksville and Zanesville have decided to send a representative to Staffordshire, Eng., to investigate the Mons gas system, and propose to install their own gas plants.

The Ravenna Motor Truck Co., Ravenna, has been incorporated for the manufacture and sale of self-propelled vehicles; $200,000; by W. F. Travos, A. N. Knuth, H. Schwartz, L. N. McKenzie, C. O. Liggett.

The Weir Frog Co., Cincinnati, has lately increased its floor space for manufacturing by about 16,000 square feet. This was done to take care of the heavy buying movement and the new extensions of the railroads in that territory. The space for the storage of raw materials has also nearly been doubled to take care of the demands for quicker shipments.

The Crescent Brass Mfg. Co., Cleveland, has certified to an increase in capital from $10,000 to $35,000, but advises this is merely to care for a surplus and that no particular changes or enlargements are being planned.

The Ohio Electric Car Co., Toledo, advises that increased demand for its products has compelled doubling capacity of its plant. Plans are being worked out covering specifications, but the company is not yet ready to make announcement of them.

The Niles plant of the Knox Pressed & Welded Steel Co., Pittsburgh, occupying the former plant of the Niles Boiler Co., was badly damaged by fire Feb. 26. The loss is estimated at about $35,000, partly covered by insurance.

The Faultless Anchor Co., Fostoria, has been incorporated to manufacture and deal in Faultless anchors, telephone and telegraph supplies; $9,000; by Clinton Bowen, Robert G. Miller, Grant Masson, Charles M. Richardson, Arthur N. Reed.

The Standard Electric Tool Co., Cincinnati, maker of high power portable electric tools, has issued its bulletins D-8 and 9, illustrating its high power drills for direct current only and also two and three-phase alternating current drills.

The Ohio Valley Electric Railway Co., Ironton, will build a new car barn and power house, 100 x 170 feet, at a cost of $100,000. Reinforced concrete probably will be used and the construction work is expected to start early in the spring.

The Alliance Motor Car Co., Alliance, has purchased the Jonathan Myers property on East Main street, Alliance, on which it will erect a new building, 50 x 160 feet, two stories, to cost $16,000. The company is incorporated for $50,000.

The Hoppes Mfg. Co., represented by E. J. Deckman, 1417 Oliver building, Pittsburgh, has taken an order from the Republic Rubber Co., Youngstown, for a low pressure steam separator for a 1,000-kilowatt turbine.

The American Machine Advertising Co., Cleveland, has been incorporated to do a general advertising, manufacturing and brokerage business; $50,000; by E. E. Wilson, George E. Haefele Jr., W. H. Thomas, A. J. Craig and John McIntyre.

Plans are being drawn by Mills, Rhines, Bellman & Nordhoff, Toledo, architects, for a new steel and concrete structure for the DeVilbiss Mfg. Co., maker of spraying apparatus. The structure will be placed on a site recently purchased, 250 x 600 feet.

The Cincinnati & Suburban Bell Telephone Co., Cincinnati, has recently increased its capital stock from $8,000,000 to $12,000,000, one object of the increase being to finance the erection of a modern 12-story office building which will be used as the main office of that company, and which has been in the course of construction for several months.

T. E. Moore, vice president and

general manager of the Bowling Green Motor Car Co., states that the increase in capital stock from $25,000 to $100,000 recently made by that company is necessary for the large increase in the company's business.

The Indestructible Sign Co., Columbus, whose incorporation has been noted previously, advises it expects soon to install a sand blast plant or first class pickling plant, a hot galvanizing plant, six or eight small electric motors, a splitting shear and more high speed drill presses.

The Patented Specialties Mfg. Co., 809-811 Broadway street, Cincinnati, is a new concern that will manufacture fireproof steel windows and elevator enclosures for modern factories and mercantile buildings. The company recently has secured the contract to furnish 75 steel window sashes for the Chas. Boldt Glass Co., Cincinnati.

The Henkel Co., Fremont, has arranged for the addition of a new department to its plant. Machinery is now being installed. Dr. Geo. Zimmerman states that the company expects, early in the summer, to erect a new building, 40 x 120 feet, three stories, to accommodate a further increase of business.

The new open-hearth plant of the Youngstown Sheet & Tube Co. will be completed about March 15. The big Mesta engine is now installed. The blooming mill machinery is being delivered by the William Tod Co., of Youngstown, and is being set up as it arrives at the East Youngstown mills. Blast furnace D will be ready for the torch likely a week before the open-hearth plant is placed in operation.

The stockholders of the National Sanitary Mfg. Co., Salem, have voted in favor of a bond issue of $125,000 for the purpose of increasing the capacity of their plant. They propose to erect a new power plant and install new and improved molding machines and other additions. The total capacity will be increased 50 per cent. F. G. Borden is president of this company.

Chester & Fleming, Pittsburgh, engineers, have started work on designs and plans for the proposed mechanical filtration plant at Steubenville. The plant will be modern in all particulars, with a capacity of 6,000,000 gallons a day. There will be several electrically driven pumps for supplying water to the higher districts of Steubenville. The plans also may include the installation of a new 6,000,000-gallon high service pump.

Extensive improvements are being made at the plant of the Hamilton-Otto Coke Co., at Hamilton. These improvements will include a coal mixer, by means of which the company expects to greatly improve its output of coke. In the future the company expects to make metallic coke exclusively, which will be sold through the Atwill-Makemson Coal & Coke Co., McCormick building, Chicago. The latter company expects, in the future, to devote the greater part of its attention to foundry furnace coke.

The Dayton Enginering Laboratories Co., Dayton, has purchased the site and factory buildings of the Pinneo & Daniels Co., manufacturer of wheels. The new site lies 308 feet along Madison street and 248 feet west along First street. The Dayton Engineering Laboratories Co. manufacturers self-starting and ignition systems for automobiles and has grown to be one of the largest industries in Dayton. The new site will be used to enlarge the present plant of the concern.

The International Steam Pump Co. has installed two two-stage turbine pumps driven by 200-horsepower motors, complete with station fittings, in the lake pumping station, Akron. Each will be capable of pumping 3,000,000 gallons per day against 110 pounds domestic pressure. This installation will complete a station which will contain five high efficiency Worthington centrifugal power units consisting of low-head as well as high-pressure types.

The Caldwell Construction Co., Youngstown, has a contract for building the Lake Erie & Youngstown railroad between Youngstown and Conneaut. This contract includes 1,400,000 cubic yards of excavation, five bridges requiring 4,600 tons of steel, a large amount of concrete masonry, a machine shop and equipment, two round houses, station buildings, etc. The grading, concrete and steel work probably will be sublet.

The Federal Carbon Co., Loveland, will erect a plant at that place in the near future. The building will be of brick and concrete, three stories, and will cost about $100,000. The company was recently incorporated with a capital stock of $1,000,000, and will engage in the manufacture of all kinds of carbon. The officers are: President, Charles Dick, of Akron, O.; secretary, General A. B. Critchfield, of Washington, D. C.; treasurer, E. H. Thorp, of New York, and general manager, Clay B. Steel, of Loveland.

Peter Frank Jr., Upper Sandusky, auditor of Wyandotte county, will open bids March 27 for the construction of a new bridge over the Sandusky river in Tymochtee township, known as the Cherokee Ford bridge. Each bidder on the superstruction must furnish his own plans and specifications. At the same time and place Mr. Frank will open bids for building a new county bridge over the Sandusky river at Mexico, Tymochtee township. Details of plans may be obtained from the county auditor.

The Chapman Engineering Co., Mt. Vernon, advises that it has recently sold 10-foot rotary gas producers to the following: The Bethlehem Steel Co., six for its open-hearth plant at South Bethlehem, Pa.; the Tremont Nail Co., three for its open-hearth plant at West Wareham, Mass.; the Granby Mining & Smelting Co., one for its plant at Roselake, Ill.; the Quebec & St. Maurice Industrial Co., one for its plant at LaToque, Que.; the Sandusky Portland Cement Co., one for its plant at York, Pa., and the Crucible Steel Co. of America, one for its plant at Syracuse.

Contracts for waterworks improvements were awarded recently by the Dayton board of control. The Dayton Supply Co. will furnish 25 tons of refined pig lead at $4.49 per hundredweight. The United States Cast Iron Pipe & Foundry Co. was awarded the contract for furnishing cast iron pipe and specials for the water department, the prices ranging from $25 to $33 per ton and $55 per ton for straight pipe, as follows: Three-inch pipe, $33 per ton; 4-inch pipe, $27 per ton; 6-inch pipe, $25; 8-inch pipe, $25; 10-inch pipe, $25; 12-inch pipe, $25; pipe specials, $55 per ton.

Authorization has been given officials of the Carnegie Steel Co., at Youngstown, to begin at once construction of a slag crushing and screening plant at the east end of the McDonald bar mill site west of Girard. Buildings and machinery are expected to cost about $100,000. Fifty acres of the Carnegie Steel Co.'s holdings of 350 acres at that point are covered with slag, some to a depth of 30 feet, and a steam shovel will be used to excavate it. The crushed slag will be marketed for use in concrete and for highway and railroad ballast.

Application for a receivership for the Cleveland-Galion Motor Truck Co., made by Elliott Bright, creditor to the amount of $350, was granted by Common Pleas Judge Pearsons, at Cleveland recently, Attorney A. B. Thompson, that city, being appointed. The request for a receivership was concurred in by the company. Mr. Bright claims the company is solvent, but that threats of litigation and possible filing of suits by other creditors might affect the stability of the concern, which is capitalized at $1,000,000, and has its offices in Cleveland and works in Galion, O. H. W. Woodward is president of the company. The application says the company owes $40,000.

Announcement was made recently by President Edwin E. Allyne, of the Aluminum Castings Co., Cleveland, that plans have been completed for a large plant to be erected in the central west. The company is not prepared to give out details at present. The fact that bauxite abounds in that section of the country, and waterpower is easily and economically obtainable, coupled with the advantages as a distributing point, would indicate the decision of the company to build there to care for its growing business. Mr. Allyne said that the duration of the shut-down of the company's plant at Manitowoc, Wis., is indefinite.

President E. W. Moore, of the Lake Shore Electric system, included in his report of expenditures during the past year for betterments the following: 4,200 feet of new track built through the village of Genoa; 2,500 feet of track on First street, Sandusky; the contracts let for building eight steel bridges, four single track bridges on the Toledo division and four double-track bridges on the Cleveland division to replace wooden bridges. A contract was made with the Sandusky River Power Co. for the purchase of its entire output from a new hydro-electric plant of 4,950 kilowatt capacity, which will be ready in a very short time now.

The Warren City Tank & Boiler Co., Warren, whose plant was recently damaged by fire to the extent of approximately $75,000, advises that it has made arrangements with other shops for doing some of its work, and that the materials are already on the way to these shops, so that the company will

be able to take care of even the most pressing orders. Mr. Hughes, of the Warren company, advises that it is making arrangements to build a temporary shop at Warren, which it intends to place in operation at the very earliest possible date. This temporary shop will be of sufficient 24-hour per day capacity to take care of the company's business until the new plant is erected. Mr. Hughes states that the company is at present undecided on the location of the permanent plant.

The Thal-Aftel architectural firm is a new partnership formed at Toledo by the consolidation of the interests of two well known architects, Edward Thal and Sidney E. Aftel. The new offices will be located at 1050 Ohio building and will be well equipped. Mr. Thal, the senior member of the firm, will give special attention to structural work which comes under the supervision of the engineering company and Mr. Aftel will devote his time to architectural designing.

The Toledo Machine & Tool Co., Toledo, has placed contracts and already broken ground for another addition of considerable extent to its present works. Last fall a new addition measuring 90 x 115 feet, three stories, was completed for pattern and storage purposes. The new addition will be a continuation of the present machine shop, with the present craneway running through the entire length of the new addition, this addition being 100 x 150 feet, three stories, thereby adding about 45,000 feet of floor space. In addition to this the company advises that a new power plant and pattern shop will be erected immediately after the completion of the present construction. Orders are being placed at the present time for the additional equipment necessary.

Blue prints have been prepared for a plant to be erected by the Cleveland Machine Knife Co., Cleveland, on a site it owns in Lakewood, at Fry avenue and the Nickel Plate railroad. The company's present shops, 946 West avenue N. W., Cleveland, have been outgrown by increasing business. The new plant will be, approximately, 60 x 290 feet, mainly one story, although the forge shop will be two stories. The plant probably will be of reinforced concrete construction, with brick veneer. A fair steel tonnage will be involved. Equipment which it is planned to add will include two large steam hammers, a surface grinder and a milling machine. Construction of the plant has been started, and it is proposed to have it completed early in July. The company is capitalized at $25,000. President, E. B. Brown; secretary, E. G. Hollman; treasurer, William La Bounty.

OKLAHOMA

The plant of the Oklahoma Corrugated Culvert Co., Shawnee, has been bought by the Dixie Culvert & Metal Co., which will make improvements to secure an increased output.

The Kidder Mining Co. and the Deep Red Mining & Milling Co., Indiahoma, have ordered a placer mining machine at a cost of about $25,000; three others are to be installed later.

Progress in financing a cotton mill project at Oklahoma City, is being made; the Western Guaranty & Trust Co., of that city, to handle a $5,000,000 bond issue. The concern owns 5,050 acres near Putnam City, where the mill is to be built.

The plant of the Southwestern Iron Works Co., Guthrie, has been sold in bankruptcy proceedings to a syndicate of Kansas City men, represented at Guthrie by John W. Thomas. The price was $110,000. The intention is to operate the plant.

PENNSYLVANIA

Fire destroyed the abandoned plant of the Hercules Chain Co., Lebanon, recently.

Fire ruined the building of the Main Belting Co., 1235 Carpenter street, Philadelphia, recently.

The New Castle Steel & Iron Co., New Castle, has ordered a 5,000-pound Chambersburg steel drop hammer from Manning, Maxwell & Moore.

The Metropolitan Electric Co., Reading, has plans for rebuilding its plant on the Schuylkill river below Reading.

The Safety Mfg. Co., Lancaster, has bought the plant of the Independent Foundry Co., consisting of a foundry and machine shop.

W. Harry Brown, Pittsburgh, has purchased a 15-ton crane from the Brown Hoisting Machinery Co., Cleveland, for unloading coal at the docks at Brownsville.

The Harrisburg Foundry & Machine Works has certified to an increase of indebtedness from nothing to $275,000. Directors recently authorized indebtedness of $300,000.

A building is to be erected at Altoona by the Pennsylvania railroad, at a cost of $150,000 to house the chemical and physical laboratories of the road.

The United States Bureau of Mines, Pittsburgh, has received a shipment of steel plates, 10 and 16 feet wide, which will be used to cover pits where experimental mine explosions will be made.

The J. G. Brill Co. has let contracts for an addition to its street car manufacturing plant at Philadelphia. The award for the structural steel went to the Keystone Structural Steel Co.

The Automatic Cashier Co., Harrisburg, has been incorporated to manufacture cash registers and like devices; $250,000; by M. C. Miller, L. S. Kaufman, of Harrisburg; Harry W. Davis, Wilmington.

Orders for iron aggregating 1,000,000 pounds, valued at over $35,000, have been received by the Sligo Iron & Steel Co., Connellsville, from the United States government. The iron is to be delivered at the Boston navy yard to be used for anchor chains for battleships.

Coke ovens of the Pennsylvania Coal & Coke Corporation at Gallitzin, which had been idle a short time on account of the installation of new bins, were scheduled to be fired recently.

The Brown Hoisting Machinery Co., Cleveland, has moved its Pittsburgh office from 510 Frick building to 822-23 Oliver building. H. C. Torrence is manager of the Pittsburgh branch.

The Pittsburgh office of Motch & Merryweather, Cleveland, has been appointed representative of the Lea-Courtenay Co., Inc., 90 West street, New York City, manufacturer of cold metal saws.

Tate, Jones & Co., Pittsburgh, have been incorporated to engage in the construction of furnaces and mills; $5,000; by J. M. Tate Jr., Sewickley; C. F. France, Pittsburgh; A. L. Wilson, New Brighton.

An increase of $3,000,000 in capital by the Federal Steel Foundry Co., Chester, is reported. The concern recently bought the old buildings of the Vulcan Brass Foundry Co., which are expected to be fitted for use.

No. 4 mine of the Vesta Coal Co., a subsidiary to the Jones & Laughlin Steel Co., Pittsburgh, has produced 13,337,599 tons of coal during a period of ten and one-half years. The property originally consisted of four square miles.

The Standard Steel Car Co. has closed negotiations for a 20-ton locomotive crane built by the Brown Hoisting Machinery Co., Cleveland. The crane will be installed in the Butler plant of the Standard company.

The Fairview Light, Heat & Power Co., Paint township, Somerset county, and the Rickingham Light, Heat & Power Co., Shade township, Somerset county, have been incorporated; $5,000 each; by J. R. Caldwell, E. A. Delaney, R. M. Mullen, Windber.

The purchase by the Pittsburgh Steel Co. of a tract of 74 acres at Brownsville is confirmed by Superintendent George Nash, who states plans for building a plant will be made public shortly. Sixty days is expected to see a start on construction of a mill.

The Duquesne Contracting Co., Pittsburgh, has purchased a 15-ton locomotive crane from the Brown Hoisting Machinery Co., Cleveland, to be operated at Youngstown, where the Duquesne company is building retaining walls for the Pittsburgh & Lake Erie railroad.

The Waverly Oil Works Co., Pittsburgh, has a complaint before the Interstate Commerce Commission against the Pennsylvania Railroad Co., and others, in reference to switching charges, which railroads and terminal lines in Pittsburgh exact for transferring cars from one line to another. Rates are claimed to be exorbitant. Some testimony has been heard.

A Pennsylvania charter has been granted the George J. Hagan Co., Pittsburgh, furnace engineer and constructor. George J. Hagan, who formerly was sole proprietor, has offices in the Peoples Bank building. This company will make a specialty of furnaces for iron and steel works, stoker-fired furnaces and water-seal continuous gas producers.

The department of public works, Pittsburgh, has awarded to the Dravo Contracting Co., Lewis building, that city, contracts for the foundations and concrete work of the proposed Bloomfield bridge at $86,514.04. The main span of the bridge will be 400 feet

long and 15 shorter spans will provide a total length of 2,000 feet. Plans for the steel work of the superstructure have not been completed.

A transfer of the property of the New Castle Forge & Bolt Works, New Castle, to the New Castle Steel & Iron Co., for $115,000, has been recorded. The latter company purchased the property at a receiver's sale some time ago. The new company, which is headed by Pittsburgh capitalists, will manufacture nuts, bolts and car appliances. Announcements of the detailed plans were given in THE IRON TRADE REVIEW several weeks ago.

William Swindell & Bros., Pittsburgh, are completing two 30-pot Sieman crucible steel melting furnaces for the Henry Disston & Sons Co., Tacony, Pa. The Pittsburgh firm is installing additional crucible steel melting furnaces for the John Illingworth Steel Co., Frankford, Pa., and the Atlas Crucible Steel Co., Dunkirk, N. Y. The company also has a contract with the Simonds Mfg. Co., Lockport, N. Y., for additional gas producers and piping. Producer gas is to be used as fuel instead of oil in these furnaces.

The Union Switch & Signal Co., Pittsburgh, has issued its annual report for the year ended Dec. 31, 1912. The net income for 1912 was $1,146,361, against $948,221 in the previous year. The surplus, after deductions for depreciation to plant, interest and taxes, amounted to $1,004,731 against $826,172 at the end of 1911. The surplus now stands at $1,720,470, against $1,918,647 at the beginning of 1912. Part of the decrease is accounted for by the declaration of a stock dividend amounting to $435,565.

The Charles N. Hays Co., First National Bank building, Pittsburgh, reports the following orders for horizontal automatic steam eliminators: One, 6-inch, for the Pennsylvania Coal & Coke Co., Cresson, Pa.; one, 8-inch and one 12-inch, for the Connellsville Central Coke Co., Pittsburgh; one, 3, and one, 5-inch, for the Dunkirk Gas & Coal Co., Pittsburgh; one, 6-inch, for the Rochester & Pittsburgh Coal & Coke Co., Punxsutawney, Pa.; one, 5-inch, for the H. C. Frick Coke Co.; one 5-inch, one 6-inch, one 7-inch vertical automatic steam eliminators for the Standard Steel Car Co., Butler, Pa.

A Pennsylvania charter has been granted the Hanlon-Gregory Galvanizing Co., Pittsburgh, which is an off-shoot of the Thomas Gregory Galvanizing Co., Brooklyn. The company will take possession of the Taten-Hogg foundry, Pittsburgh. The following incorporators are named in the charter: Thomas M. Gregory, William Johnson, John A. Hanlon, A. J. Loeffler and A. J. Diebold, all of Pittsburgh. Officers are: A. J. Diebold, president; Thomas M. Gregory, president of the Thomas M. Gregory Galvanizing Co., vice president; William M. Gregory, secretary of the Gregory company, secretary; A. J. Loeffler, treasurer; and John A. Hanlon, former president of the Pittsburgh Galvanizing Co., general manager.

The Pittsburgh Industrial Development Commission announces that a new company, known as the Federal Enameling & Stamping Co., capitalized at $150,000, will take over the property of the Star Enameling & Stamping Co., McKees Rocks, which has been idle for more than two years. The property obtained by the Federal company includes six acres, and the plant has 115,000 square feet of manufacturing floor space. Pittsburgh capital is interested. The new company will manufacture enameled kitchen ware. The Industrial Development Commission is responsible for 14 new companies locating in Pittsburgh in the past year.

The plans of Architect Edward A. Phillips, of New York City, for the new buildings of the Bronze Metal Works, Meadville, have been approved. T. F. Secrist, superintendent of the plant, will be in charge of the construction work on the new buildings, which will be of mill construction and which will provide a floor space of 15,000 square feet. These buildings will be equipped with power machinery, including a number of electric trucks for handling the metal. Plans for a new boiler plant will be ready soon. The foundry will be the largest single department of this plant with a floor space of 10,000 square feet. Edward Fallows is president and Alexander Turner general manager.

RHODE ISLAND

The Providence Engineering Works, Providence, manufacturer of Rice & Sargent Corliss engines and engineering contractor for power equipment, has been reorganized and is continuing its contract work as before. This company was discharged from the hands of the receivers Jan. 20, 1913, after which it began business on a new basis. The house was founded in 1829 as the Thurston & Gardner Co., and 30 years later became the Providence Steam Engine Co., which name continued until 1899, when the business was incorporated under its present name. The personnel of the newly-organized company includes James Coulter and Norman Leeds, both prominent in the management of the Automatic Machine Co., Bridgeport, Conn. Mr. Coulter has the mechanical and engineering supervision of the Providence Engineering Works. Associated with him on this side of the management is the old engineering staff of the company. Richard A. Robertson remains as president of the corporation, and continues actively to participate in the management. The other officers are as follows: Vice president, James Coulter; treasurer, Norman Leeds; assistant treasurer and secretary, Frank L. Vaughan. The directors are President Robertson, Vice President Coulter, Treasurer Leeds, Assistant Treasurer and Secretary Vaughan and James M. Scott, Randolph T. Ode and Arthur A. Fuller, Providence; V. Everit Macy and F. Kingsbury Curtis, New York City.

SOUTH CAROLINA

The directors of the Carolina, Clinchfield & Ohio Railway Co. have approved plans for a modern coal pier at Charleston, with storage space for 350,000 tons in pockets.

The Manufacturers Power Co., Spartanburg, has perfected arrangements for development of water power on the Green river in Henderson county, N. C. Plans involve eventual expenditure of $1,000,000 and development of 50,000 horsepower. Officers of the company are: President, W. S. Montgomery; vice president, A. L. White; secretary-treasurer, John A. Law.

SOUTH DAKOTA

Henry H. Hyde and associates, Pluma, have obtained control of the Deadwood Lead, Gas & Fuel Co. and have reorganized it as the Belt Gas Co. It is planned to expend $30,000 in putting in a plant here.

TENNESSEE

Lenoir City has voted a $40,000 bond issue to establish a municipally-owned waterworks.

The Lookout Boiler & Mfg. Co., Chattanooga, has increased its capital stock from $25,000 to $50,000.

The Tullahoma, Lynchburg & Fayette Railway Co., will build 12 bridges in Tennessee. W. G. Cummings, Manchester, is in charge.

The Manufacturers' Association of Chattanooga can give information in regard to a $100,000 motor truck factory, which is to be located in that city.

The Lafollette Coal, Iron & Railroad Co., Lafollette, it is reported, will develop ore lands and build a blast furnace in the locality of Knoxville.

A considerable tonnage of steel will be required in the construction of a four-story show room building for the Standard Furniture Co., Nashville, at a cost of $60,000. M. F. Greene is secretary of the concern.

The American Zinc Co., of Tennessee, is installing two Prescott power pumps in the main shaft of its plant at Mascot, one for taking care of mine water and one for general supply.

TEXAS

W. J. Wyatt, Dallas, has organized the Wyatt Metal Works for the manufacture of metal specialties.

The Guadalupe Water Power Co., Cuero, is planning construction of a series of hydro-electric plants on the Guadalupe river.

Extensive improvements, including new equipment, are to be made in the plant of the Victoria Electric Co., Victoria.

The Southwestern Iron & Wire Works, El Paso, has been incorporated; $6,000; by J. A. Shedd, Fred B. Moore, Milton T. Shedd.

The Long Mott Gin Co., Long Mott, has been incorporated; $7,000; by D. L. McDonald, Archie McDonald, W. H. Badger.

The Planters Gin & Mill Co., Victoria, has been incorporated; $10,000; by Otto Fiek, John Zimmer, A. W. Pickering.

The Humble Iron Works, Humble, has been incorporated to manufacture oil well supplies; $10,000; by H. S. Cameron, T. W. Horn, P. O. Davant.

The National Safety Lock Co., Tex-

arkana, has been incorporated; $25,000; by P. L. Hudson, A. C. Oliver Jr., A. S. Harrington, all of Texarkana.

The Piasa Tractor Co., Jayton, has been incorporated to manufacture engines, trucks, tractors, etc.; $400,000; by Milo S. Palmer, William E. Palmer, Myrtle P. Glaze, all of Jayton.

The Industrial Cotton Oil Co., Dennison, in order to re-establish its business on a more extensive basis is contemplating the installation, in the near future, of $100,000 worth of machinery.

The Ellison Furniture & Carpet Co., Fort Worth, has let a contract to the Bryce Construction Co. for a new factory 100 x 100 feet, four stories, steel and reinforced concrete, costing $40,000. Machinery costing $10,000 to $15,000 will be installed.

Additions to its electric plant, probably a steam turbine of 5,000 kilowatt capacity, will be made by the Houston Lighting & Power Co., Houston. Boiler room equipment will be enlarged also and a heavy crane installed in the engine room.

UTAH

Fires have been started in the reverberatory furnaces of the copper smelting plant at Tooele, and smelting will be begun at once from the ore now in the storage bins.

VERMONT

The Bennington Scale Co., Bennington, has been reorganized with $30,000 additional capital, making the company a $60,000 concern.

Two buildings at the Burlington plant of the Shepard & Morse Lumber Co., of Boston, together with their contents of machinery, were destroyed by fire recently. The loss is estimated at $100,000.

WASHINGTON

The Automatic Drill Attachment Co., Colfax, is being incorporated by P. R. Duchomin and associates and will build a factory here to manufacture tools. Mr. Duchomin goes east shortly to superintend manufacture of the machinery needed.

Stanley Mayall, general manager of the Armstrong Machinery Co., Inc., Seattle, announces perfection of a process at that plant for utilizing waste steel for making semi-steel castings for its ice machines. Formerly this was shipped east for a low return. He claims the cost of castings has been reduced and their strength increased.

WEST VIRGINIA

The Stiles Mfg. Co., Parkersburg, has sold its plant to the Valley Machine Co.

Huntington is planning to issue additional bonds to the amount of $300,000 for the construction of a waterworks plant.

Robert D. Hennen, civil engineer, and G. B. Hartley, civil and mining engineer, both of Morgantown, have combined their offices under the firm name of the Monongahela Valley Engineering Co., which will do a general engineering business.

The Rathbun - Jones Engineering Co., Toledo, O., recently closed a contract with the Wheeling Corrugation Co., Wheeling, for a 385-horsepower gas engine which will be added to the equipment of the Wheeling factory.

The Joseph L. Seldon Engineering Co., Toledo, O., recently secured a contract for waterworks installation in the new factory of the Owens Bottle Machine Co., at Fairmount. The order includes the installation of a 500-gallon centrifugal pump, a direct connected 75-horsepower motor and the re-arranging of 3,000 feet of pipe line. The price named in the contract is $5,000.

WISCONSIN

The Badger Foundry Co., Racine, has just completed an addition.

The A. H. Strange Co., Merrill, is to add a planing mill and box shook department to its sash and door plant.

A new factory is to be erected this spring for the National Gauge & Register Co., La Crosse, to accommodate increase of business.

The Worden-Allen Co., Milwaukee, has been awarded the contract for building a steel bridge at Howard's Grove, Sheboygan county, at $2,948.

The Holbrook-Armstrong Iron Co., Racine, has completed an addition, 60 x 80 feet, to its foundry and has installed a 20-ton cupola and 5½-foot Root blower.

The Peoples Gas & Heating Co., Rice Lake, has been incorporated to operate a central heating plant; $25,000; by A. W. Ambrose, A. G. Clark and E. Knudson.

The La Crosse Gas & Electric Co., La Crosse, now under new management, announces considerable remodeling of the generating and gas plants.

James B. McCue and Joseph W. Moore, doing business under the style of the West Allis Machine Co., West Allis, have dissolved their partnership.

M. D. Keith, of Green Bay, a director of the Wisconsin & Michigan Railroad Co., is authority for the statement that the company will extend its line as far as Crandon during 1913.

The engineering works recently opened at Marinette by D. C. Prescott, of the Marinette Iron Works, is turning out a hose reel and other specialties.

The city of Racine has contracted with the Allis-Chalmers Co., Milwaukee, for gravel pit hoists and machinery for its municipal quarries and gravel pits, at a cost of $7,600.

The Northwestern Molding Sand Co. has been organized at Beloit by W. S. Perrigo, H. W. Adams and Charles H. Shaw. The company is incorporated at $75,000.

The Chicago & Northwestern Railroad Co. is to reconstruct its drawbridge in Milwaukee, near Erie, South Water and Florida streets, the coming spring. Four trackways will be provided.

Hanley Bros., commission merchants at Racine, with branches in Kenosha and Chicago, are preparing to build a new refrigerator and cold storage plant, to be equipped with ice-making and refrigerating machinery.

Permission has been granted by the war department to the city of Milwaukee to erect a bascule bridge at Buffalo and Ship streets, and a bond issue of $175,000 is before the council. It is expected construction will start not later than Sept. I.

F. O. Simmons, Milwaukee, commissioner of public works, has been instructed to determine the extent of condemnation for a viaduct to cost $350,000, crossing the Menominee valley at Thirty-fifth street and Thirty-first avenue.

C. B. Smith, secretary of the Stewart-Warner Speedometer Corporation, Beloit, has sent assurance to the city officials that two wings are to be added to the plant in Beloit, to accommodate enlarged activities of the concern.

The Davies Threshing Machine Co., Oshkosh, awarded the contract for the construction of a one-story addition, 65 x 126 feet, to August Pitz, of Oshkosh. The company is cramped for room, and the contractor will receive a bonus for rapid work.

The Prairie du Sac Light & Mill Co., Prairie du Sac, has been organized to utilize water power of the Wisconsin river for producing current for light and power, and to operate a mill; $25,000; by C. E. Blake, Minnie Fitzgerald and J. B. Sanborn.

Peter Campbell, assistant superintendent of the Chicago & Northwestern Railroad Co., states that plans for the proposed enlargement of the passenger and freight terminals at Milwaukee, costing about $2,000,000, will be completed by the company's architectural department on March 15.

The John Pritzlaff Hardware Co., Milwaukee, one of the largest wholesale hardware firms in the middle west, has increased its capital stock from $600,000 to $1,000,000. The additional issue will be devoted to an expansion of the business and covers proposed additions to warehouses and stocks.

The McKenzie Mfg. Co., La Crosse, has purchased a site on the North Side at La Crosse, for the construction of a modern factory building for the production of farm implements. The concern is occupying temporary quarters at 1648-1656 Berlin street, but its facilities are sufficient to afford a production less than half of that required to fill orders.

The Bucyrus Co., South Milwaukee, has been awarded contracts for furnishing two steam dipper dredges of 15 tons capacity each, to the United States government for delivery to the Panama canal district on Dec. 1, 1913. The contracts amount to about $350,000. The Bucyrus Co. has furnished a large per cent of the steam dredges and excavating machinery for the Panama canal project.

The board of school directors, Milwaukee, has received plans and specifications for the proposed new $425,000 Riverside high school building, Oakland avenue and North Park Front, from the architects, Van Ryn & DeGelleke, Milwaukee, and is now preparing the call for bids. Frank M. Harbach is secretary of the board and Carrol G. Pearse is superintendent of schools.

Following a decision of the Wis-

consin supreme court, giving permission to the heirs of John Plankinton, to lease for 99 years to Charles W. Somers, of Cleveland, O., the Plankinton block, in Milwaukee, he will improve it by the erection of a hotel, office building and theater, all steel construction. The cost is estimated at $5,000,000. George A. Harvey, of Cleveland, is representing Mr. Somers in Milwaukee.

The Standard Aluminum Co., Two Rivers, is planning to erect a new shop building to be completely equipped as a rolling mill to produce all the sheets for the other departments. The company is negotiating with aluminum ingot makers in Italy for raw material. Plans for the extension will be made about March 1, on the return of William Bremer, superintendent, from a tour of inspection of rolling mills in the east.

D. C. Prescott, founder of the Marinette Iron Works, and one of the best known men in the iron, steel and machinery industry of the northwest, has organized the Engineering Works at Marinette to manufacture hose reels and other devices formerly manufactured by E. C. Prescott and William and John Casson, at Menominee, Mich. The Engineering Works has equipped a factory on Cook street, Marinette, and has started operations. The company will have general offices in Chicago, with D. C. Prescott in charge. Theodore Disch is manager of the works and the factory offices in Marinette.

The Fairbanks-Morse Mfg. Co. has acted on options taken some weeks ago on a tract of 80 acres adjoining its present Eclipse works at Beloit, and purchased the acreage for $80,000. On March 26, the date of the postponed annual meeting of the corporation, plans for the extension of the works will finally be decided upon. The company now employs 2,250 men in its Beloit works, and has been desirous for some time to increase its capacity. Until now, however, the high prices demanded for suitable acreage caused a delay in the progress of its plans. Officers will be elected at the adjourned annual meeting on March 26, to be held at Beloit.

The Globe Foundry & Machine Co., Sheboygan, has been reorganized, following changes in the ownership of all the shares. Paul Klumb has sold his interest to Jacob and William Hilpershauser, and E. R. Thiel, who formerly was associated with the concern, and Arthur Miller have purchased the remaining shares. Officers have been elected as follows: President, Jacob Hilpertshauser; vice president, William Hilpertshauser; secretary, Arthur Miller; treasurer, Ervin R. Thiel. The company may build a new plant on the north side at Sheboygan this year. Mr. Klumb retires from active business and will spent some time in travel with Mrs. Klumb.

The Hans Motor Equipment Co. is the new name of the National Gauge & Register Co., of La Crosse. The company has been recapitalized and is about to erect a $50,000 factory group at La Crosse, for the production of gasoline tank gauges, registers, filler caps, air pressure pumps, crank case oil pumps and gauges, sight feed oilers, gasoline separators and other devices for automobiles and motor trucks. The company was founded at Minneapolis, Minn., by Edmund E. Hans, about three years ago, and moved to La Crosse in 1911. It is now supplying 60 automobile manufacturers with its devices and during the months of November, December and January turned out 1,750,000 parts. P. N. Minguy, formerly head of the sales and metal departments of the Eagle White Lead Co. and western representative of the National Lead Co., at Cincinnati, has been appointed assistant manager. The La Crosse Industrial association has interested itself in the concern and has provided capital to insure the construction of new works.

ALASKA

The Guggenheim Dredge No. 1, at Dawson City, Yukon, was destroyed by dynamite on Tuesday, Feb. 25, the loss amounting to $75,000.

An electric power plant of 500-kilowatt capacity will be constructed at Valdez by the Alaska Water, Light & Telephone Co. The contract has been awarded the Pelton Water Wheel Co., San Francisco, for a hydraulic turbine of the Francis reaction type. Water will be brought to the plant through 30-inch wood-stave, steel-banded pipe and the equipment will be modern.

CANADA

ALBERTA

Edmonton rate payers endorsed by-laws recently providing for the expenditure of $5,000,000. Of this, $484,720 will provide the cost of a power house and equipment, $453,086 for an electric lighting system, $1,543,320 for a street railway, $453,154 for bridge improvement, and $168,386 to acquire the government telephone system within the city limits.

BRITISH COLUMBIA

Five hundred men will be put to work next week on the Kaslo and Slocan section of the Canadian Pacific railway. The line will be laid with heavy steel and old narrow gage bridges are to be replaced. This will provide communication with the mines and timber dstricts.

MANITOBA

Space has been leased by the Hughes Electric Heating Co., of Chicago, in the Brown-Power building, Winnipeg, for use as a factory for turning out electric stoves, ranges and heaters, the first to be made in Canada.

The city of St. Boniface has awarded the contract for the substructure for the new Provencher avenue bridge to McDonald, McDonald & McGougan, for about $220,000. It includes the concrete piers on which the superstructure will rest and must be finished by Nov. 1.

The Canadian Rotary Engine Co., Ltd., Winnipeg, has been incorporated with $500,000 capital to manufacture and deal in machinery of every class, including engines and fixtures. The incorporators are John McKechnie, manufacturer; William Brydon, valuator; James F. Stuart, James Miller and Hubert L. Call, engineers; and Angus P. Cameron, agent, all of Winnipeg.

NEW BRUNSWICK

At the annual meeting of the St. John Railway Co., it was announced that an offer of $1,200,000 for the stock had been made by financiers, including John P. Graham, president of the Bangor (Me.) Street railway. The offer was referred to a committee.

The New Brunswick Coal, Iron & Clay Co., Ltd., with $275,000 capital, is seeking incorporation with head office at St. John. It proposes to carry on operations in Queens county where there are coal and clay deposits and iron ore.

The manager of the Maritime Nail Co., St. John, has announced that the company's extensive works, which were enlarged last year, will further be enlarged this year. The company also proposes to build a factory at Fort William, Ont., for western business.

Construction work will commence this month on a spur line to Maryville, in connection with the Gibson & Minto railway. The contract has been let to A. E. Trites & Son, of Fredericton, and the sub-contract for the concrete work has gone to C. Fred Baird, of Fredericton.

The public works department of New Brunswick has awarded to the Dominion Bridge Co., Montreal, the contract for the superstructure of the new arch bridge, which will replace the present suspension bridge at St. John. The cost will be about $275,000, and the bridge is to be completed by June 1, 1914.

The Canadian Pacific Railway Co. is considering the question of replacing the cantilever bridge by which it enters St. John from the west by a new structure. The provincial government has just awarded a contarct for the construction of a street car and traffic bridge close to the present C. P. railroad bridge.

Bids will be received until 8 p. m., March 5, by Alex J. LeBlanc, town clerk, Dalhousie, for a power house, booster pump, steam pump, turbine pump, two boilers, electric light engine, high speed steam engine, gas engine and gas producers, Diesel oil engine, crude oil engine, electrical equipment and distribution system. Plans and specifications at office of Chipman & Power, Mail building, Toronto, or at Dalhousie.

NOVA SCOTIA

The Cape Breton Electric Railway Co., Sydney, decided at its annual meeting last week to spend $200,000 during the year on equipment. A new boat will be added to the ferry service.

ONTARIO

The Riordon Pulp & Paper Co., Hawkesbury, will develop about 9,000 horsepower on the Rouge river.

The city of St. Thomas has been granted permission by the Ontario legislature to issue debentures for the loan of $15,000 to the Erie Iron Works.

The Ottawa Light, Heat & Power Co. will issue $500,000 in new stock to shareholders to provide funds for a new gas plant at Ottawa.

The contract for building the 17-mile branch line of the T. & N. O. railway from Iroquois Junction to Iroquois

river, has been awarded to McDougal & McCluskey, of Cockrane.

A representative of the Solvay Process Co., of Detroit, has been in Sarnia looking for a site on which to locate a Canadian branch of that company.

The Richards-Wilcox Canadian Co., London, has been incorporated: $70,000; to manufacture builders' hardware; provisional directors, William R. Yendall, William H. Fitch and Lee E. Mighell.

The town of Bowmanville asks for tenders to be received up to March 19 for iron pipes, hydrants, electrically operated Booster pump, sewer pipe, etc., in connection with a waterworks and sewerage system.

The town of Sarnia asks for tenders to be received up to March 15, for cast iron or steel water pipes, gate valves, pumping machinery, boilers, etc., required for a waterworks system.

The Reynolds Products Co., Toronto, has been incorporated to manufacture steam and electrical appliances and machinery; $40,000; provisional directors, Gideon Grant, David I. Grant, Bruce Williams.

The Masterton Wrench Co., Toronto, has been incorporated to manufacture hardware and metal goods; $45,000; provisional directors, Robert McKay, Gideon Grant, George A. Urquhart.

The Shales Products Co. is erecting a plant at Caledon, where it will manufacture brick and tile. The company expects to turn out 60,000 bricks a day. The buildings will be completed in a month or so.

The city of Toronto will build a light scow for diving operations, a scow for derrick work with hoisting engine, drum, pump, etc., and a pile driver. The work will be started at once in order to have these ready for the spring.

Large additions will be made by the Steel Co. of Canada, Hamilton, to its works at Belleville, which will provide for the employment of 150 men at the mills. The Canadian Northern railway will run its track into the new plant, the construction of which will be under the supervision of the city engineer of Belleville.

The Garlock Packing Co., Hamilton, has been incorporated to manufacture and sell engine packings and pipe and boiler coverings and engine and mill supplies. It has a capital stock of $200,000 and includes the following incorporators: J. M. Byrne, A. C. Pulver and A. R. Bell, all of Hamilton.

The Engineering Specialties Co., Ltd., Toronto, has been incorporated to manufacture and deal in castings and machinery in connection with the production of heat, light and power, plumbing fixtures, etc. Its incorporators include David Henderson, William H. McGuire, George Rooney, all of Toronto.

According to an agreement with the Hydro-Electric Commission of Ontario, the city of Peterborough will acquire a dam and plant for generating power to supply the municipality. The commission will deliver to the city at the earliest possible date 1,000 horsepower of electrical energy, the city to provide the necessary equipment.

The light commission of Berlin will spend $50,000 this year in connection with its electrical system, plans for which have been submitted to the hydro-electric commission of Ontario. A sum of $10,000 will be spent in purchasing new gas mains and a supply of meters, and an additional $15,000 will be spent in increasing the gas service. The Merchants Rubber Co., of Berlin, has purchased 300 horsepower from the electrical department.

The Niagara, St. Catharines & Thorold Railway Co. has purchased a 750-kilowatt rotary converter and transformer for its Niagara-on-the-Lake extension. The company also has placed an order with the Canadian General Electric Co. for two 500-kilowatt rotary converters and transformers for a new power station in St. Catharines. The expenditure involved amounts to $50,000. The same company has ordered four double-truck cars at a cost of $30,000. Other purchases are contemplated.

Tenders will be received by P. E. Ryan, secretary of the Transcontinental railway, Ottawa, until March 11, for 1,732 gross tons of 90-pound steel rails (A. S. C. E. section), delivered f. o. b. cars at St. Anselme, Que., and 4,349 gross tons of 80-pound steel rails of the same section delivered f. o. b. cars at Hervey Junction, Que., on or before June 1, 1913. Tenders must be on forms supplied by the commissioners, which may be had from Gordon Grant, chief engineer, Ottawa.

The Ontario government has issued new regulations for the inspection of steam boilers to go into effect July 1. These regulations are framed to secure a uniform standard for the Canadian provinces, so that a certificate granted in respect of one province will be accepted by any of the others. Steamboat and railway boilers are not included as they are covered by other legislation. To carry out the provisions of the act, the province will be divided into districts, with a chief inspector and several district inspectors.

PRINCE EDWARD ISLAND

Tenders will be received up to March 25 for a car ferry terminal at Carleton Point, by L. K. Jones, assistant deputy minister and secretary of the Canadian Department of Railways and Canals, Ottawa, Ont. Plans and specifications may be secured from the chief engineer of the Intercolonial railway at Moncton, N. B.

QUEBEC

The Canadian Pacific Railway Co. is asking for bids for the construction of repair shops. The company has plans for enlarging its shops at McAdam Junction, N. B.

Metal Products, Ltd., Montreal, has been incorporated with a capital stock of $25,000 to deal in metals and their products and by-products, and to manufacture specialties and novelties of metals of all descriptions. The incorporators include G. L. Kavanagh and Alex. Ellison Jr., merchants; Jonathan Whitsell, manufacturer.

The Canadian Pacific railway has apportioned $16,000,000 for use this year in extensions of its eastern lines. Much of the money will be used in double-tracking existing lines.

Process Engineers, Montreal, has been incorporated with capital stock of $100,000, to carry on the business of general engineering and to manufacture and deal in plant, machinery, tools, builders' and contractors' supplies, etc. The incorporators are John W. Cook, K. C.; Allan A. Magee, and others, Montreal.

The Self Acting Pump Co., Ltd., Montreal, has been incorporated with $300,000 capital to manufacture wind mills, towers, tanks, pumps and all castings and machinery necessary thereto. Its incorporators are Rene Chenevert, Frank Callaghan, Holsey L. Mitchell, Jean E. Saucier and Percy Gregory, all of Montreal.

Miller Brothers & Sons, Ltd., have been incorporated with head office at Montreal, and $250,000 capital, to manufacture and deal in machinery and plants of all kinds, boilers, tools, castings, dies, etc. The incorporators are W. M. Marler, L. H. Cholette, J. A. Maucotel, of Montreal; H. M. Marler, of Drummondville, and D. M. Rowatt, of Westmount.

The Shawinigan Water & Power Co., Montreal, is putting in a third electric unit of 15,000 horsepower, increasing the total capacity to 100,000 horsepower. Future developments include an additional 30,000 horsepower installation. The development of Cedar Rapids on the St. Lawrence river is being pushed ahead in conjunction with the above company. This will develop 100,000 horsepower and will be ready by the fall of 1914.

The John McDougall Caledonian Iron Works Co. has been awarded by the city of Montreal the contract for two 12,000,000 imperial gallon pumping units at a cost of $50,046. The units consist of two 20-inch three-stage Worthington turbine pumps, directly connected to 750-brake-horsepower Browett-Lindley high-speed engines, running at 350 revolutions per minute and operating against a water pressure of 92 pounds.

The Dominion Bridge Co. is building a bascule bridge on the Lachine canal banks, at St. Pierre aux Liens, Quebec, near the Canada Car & Foundry Works. The total length will be 300 feet, the moving part 200 feet and the weight 600 tons. The bridge is being constructed so as to be operated by hand if the power fails. The contract was let by the Canadian government, and will be completed in time for navigation opening.

SASKATCHEWAN

The city commissioners of Saskatoon, call for tenders up to April 15, for one motor pumping engine of 500 gallons capacity, and one of 1,000 gallons capacity, tenders being asked to quote on their own specifications.